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VOLUME XII JANUARY 15, 1923 NUMBER 2

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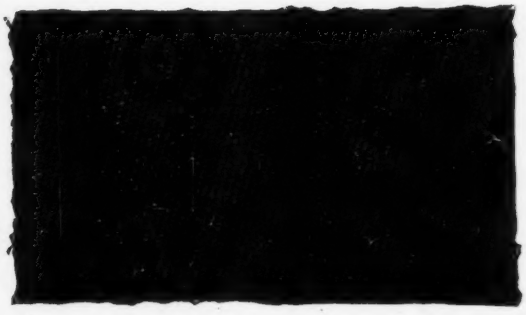

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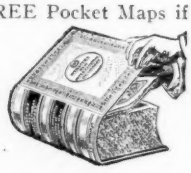

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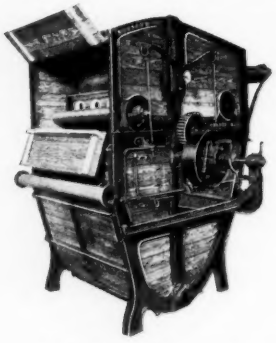

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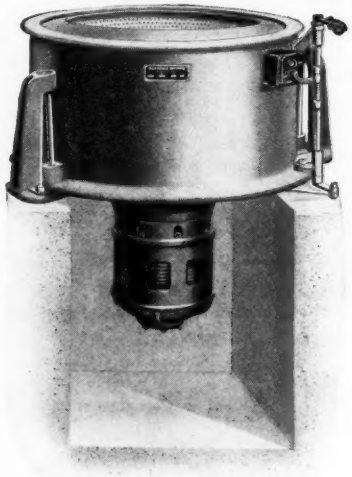

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VOLUME XII NEW YORK, JANUARY 15, 1923 NUMBER 2

The Dyes Used in Photography

Dyes and Photography—Filters—Sensitizing—Development—Desensitizing—The Coloring of Electric Light Bulbs—Transparencies—Hand Coloring of Transparencies and Photographs—Dyes for Microscopical Stains

By D. S. MUNGILLO, Chemist

Research Laboratory, Eastman Kodak Co., 1917-21; Craftsman Film Laboratory, New York City, 1921

and

C. W. GIBBS, Physicist

Research Laboratory, Eastman Kodak Co., 1918-21; Victor Animatograph Co., New York City, 1922

Members: Technical Photographic and Microscopical Society

[Note—While interest in the following article will be academic so far as a majority of our readers are concerned, it was felt that the lack of general information as to the comparatively recent growth in importance of this branch of dyestuff application was sufficient reason for publishing it as an educational, rather than a strictly useful, feature of this issue.—Ed.]

Dyes and Photography

VISITORS to the 1922 Chemical Show in Grand Central Palace, New York City, could not help but notice the almost universal tendency among exhibitors to utilize photography as an added means of telling their stories. Nearly every booth displayed photographs illustrating raw products, factory scenes, application of the product, etc. In short, the photograph was used either to attract the eye or to illustrate something which could not easily have been shown in any other way.

In the presentation of the various papers at meetings of the many societies and associations, motion pictures and lantern slides were so extensively used as to cause considerable comment. In a word, then, the Chemical Show was added evidence of the great advance of photography in every field, and of the fact that it is rapidly taking its place not only as an essential adjunct to practically all industries but as one of the country's great industries itself.

In view of this, it is really more or less astonishing that there are actually firms engaged in the dyestuff industry which do not realize how important a part dyestuffs play in photographic work. It will be the purpose of this article to point out where and how dyes are used in photographic processes, and what these dyes are.

This article is by no means as complete as the authors could wish, for the reason that a majority of the firms engaged in various applications of photographic work have their own processes, formulas and dyes; and these they will not divulge. Many experimenters in photography, and their methods, are unknown, but in so far as is possible within these limitations this article will be found authentic.

Filters

Colored light filters are used to control the color of the light falling around the sensitive photographic emulsion. Filters are a necessity in all branches of photography; they produce results that would be impossible without their aid.

Filters are prepared by incorporating a dye in a gelatine solution and then coating the solution on prepared glass. After drying, the film is stripped from the glass. On occasion filters are also cemented between sheets of glass with Canada Balsam. Filters require dyes of first-rate stability, as they are used in conjunction with intense light sources. Dyes that fade, darken or discolor are, of course, unsuitable.

Filters are made for the following classes of work:

Orthochromatic—Used for the purpose of lowering or removing the excess of ultra-violet, violet, and blue light, which is always present even in panchromatic plates.

Color Photography—Used in taking and projecting color photographs.

Contrast—Used in microscopic and copying work.

Photometric—Used for matching the color of one illuminant to another.

Neutral—Used for reducing the intensity of light without affecting the color. The majority of neutral filters are made from a combination of dyes.

Experimental—Used in many different lines of experimental and research work.

These filters are not bound by any rule in the divisions outlined above; this outline merely shows their usual application. Aside from being used in photography, the filters find many uses in visual color research work and in theater illumination.

In connection with the use of filters in microscopical work, the section to be photographed is often stained so as to obtain more detail, better contrast or greater resolving power.

Dyes used in filter making are usually quite pure, though many commercial dyes may be used if they are purified and standardized. Many very suitable dyes contain a considerable amount of loading matter (i. e., sodium sulphate and sodium chloride), and these are purified by taking advantage of the solubility of the dye in various solvents, such as methanol, ethyl alcohol, benzene, ether, chloroform, ligroin, etc. After evaporating the filtrate, the pure dye is obtained.

The various filter dyes of Hoechst, Bayer, and Badische such as Filter Yellow K, Rapid Filter Red, Rapid Filter Green, Filter Blue Green and others, are now partially replaced by purified commercial dyes. For Filter Yellow K some makers are now using Tartrazine and Wool Yellow X Conc. The Eastman Kodak Company uses a dye of its own manufacture which it calls Eastman Yellow, this dye being the sodium salt of glucose phenylosazone *p*-carboxylic acid.

Practically all water-soluble acid and basic dyes are used for filter making. Acid dyes are also mixed with each other to give intermediate colors; likewise with basic dyes.

The following list comprises practically all the dyes used in filter manufacture:

Dyes for Filter Making—[1]

Filter Yellow K	Aesculine
Rapid Filter Blue	The Pure Food Dyes
Rapid Filter Green	Amaranth
Rapid Filter Blue Green 1 and 2	Tartrazine
	Orange I
Rapid Filter Red 1 and 2	Indigo Carmine
	Ponceau 3R
Victoria Blue B	Light Green SF Yellowish
Naphthol Green B	
Rose Bengal	Erythrosine
Crystal Violet	Methylene Blue
Methylene Blue	Guinea Green B
Acid Rhodamine	Malachite Green
Toluidine Blue	Brilliant Green
Patent Blue	Alizarine Blue
Thionine Blue	Capri Blue
Parafuchsine	Nile Blue
Fuchsine	Fast Green Bluish
Eosine	Acid Violet
Rhodamine	Ethyl Violet
Safranine	Methyl Violet
Acridine Orange	Flavazine T
Acridine Yellow	Xylene Red
Chrysaniline	Eastman Yellow

Sensitizing

The ordinary photographic emulsion of silver halide and gelatine which is coated on a suitable support is sensitive only to blue, violet, and ultra-violet light. Photographs of colored objects made upon this type of emulsion do not correctly render the colors in monochrome. By the addition of dyes to the photographic emulsion this fault may be corrected to a great extent.

Sensitizing by dyes may be done by incorporating the dye in the emulsion previous to coating, or by bathing the dry plate or film in a dye solution.

Dyes used for sensitizing are substantive; that is, they dye substances directly without staining the gelatine. If the dye stains the gelatine, extremely long exposures will be necessary. This is a great disadvantage in photographic work.

Sensitizing Dyes—[2]

Eosine	Erythrosine
Rose Bengal	Dicyanin
Safraeosine	Kryptocyanin
Rhodamine	Acetaminocyanole
Phloxine	Naphthacyanole
Cyanoesin	Acridine Orange
Rapid Filter Yellow	Homocol
Pinaverdol	Orthochrom T
Pinacyanol	Sensitol Violet
Pinachrome	Isocol

Isochinoline Red

Development

Sensitive photographic emulsions are usually handled in a darkroom by means of a colored illuminant. The sensitivity of the emulsion will determine the color of the light used. In all plates there is some insensitivity to certain wave lengths in the spectrum. This fact is taken into account when the safelights are designed. The colored lights are sometimes made by incorporating a suitable dye in a solution of gelatine and then coating it on an ordinary-electric bulb. This will be taken up in detail in another section. The more common way, however, is to have a lamp-house with interchangeable screens of various colors for the different types of emulsions. Screens are made of colored glass, paper or gelatine, or a combination of these materials.

The essential of a good safelight is to have as much visual light as possible in the darkroom without fogging

(*Continued on page* 84.)

Carpet Yarn Dyeing

Improvements in Process—Varying Demands—Role of the Dyer in Carpet and Rug Production—A Useful Publication—Scouring—Slow Drying Essential for Ground Colors—Oriental Dyeing Secondary to Weave and Artistry

By LOUIS J. MATOS, Ph.D.

National Aniline & Chemical Company

COLORING of carpet yarns, and yarns for other kinds of floor coverings is, of itself, not a difficult matter in view of the equipment of modern dyehouses. Formerly, when the work was done in the old open dye tubs, the job was perhaps the most "sloppy" of any dyeing operation. At the present time, with improved dye kettles, the yarn is delivered in a very much better condition and decidedly more even in shade.

In dyeing yarns for the carpet trade, the dyer occupies a position with respect to the designer that is relatively the same as that of a builder to the architect. The designer and architect prepare plans that are followed by the dyer and builder respectively. In designing carpets or rugs many conditions must be given consideration that lead to a finished fabric of harmonious design, and in which the coloring of each of the design elements plays a most important part. In making the design the artist is constantly humoring his colors, shading and toning, until the completed pattern thoroughly harmonizes so that no one color appears more prominently than its neighbors.

Varied Demands on the Designer and Dyer

Of course, there are carpet designs made for certain classes of trade, and in which strong and brilliant shades are demanded; then again, there are other designs that appeal to a somewhat different trade, and in which the colorings are more refined and subdued. All these different color effects are governed by the particular trade that the finished carpet is intended for. Another class of coloring largely affected in rugs is the so-called "Oriental," where the shades are so toned as to impart the appearance of age and antiquity.

All these various colorings are worked out in the designing room, and when the design is completed it is usual to have sample lots of yarn dyed and woven into patterns so that the designers and the selling force of the manufacturers may see what is under way. It is during the inspection of the woven sample pattern that a few points are to be finally determined. There may, and probably will, be some changes in the make-up of the colorings; a red is to be brightened, a pink slightly shaded with a blue, an olive toned with a little yellow, the ground color darkened or lightened, etc. Then the exact kind of yarn is to be determined to set off the figure to the best advantage; in this regard it is well known that the count and quality of the yarn plays a most important part in the appearance of a carpet; in some instances a poor yarn, or an unsuitable one, may spoil what is otherwise a good design irrespective of the beauty of the individual colors.

The Role of the Dyer

Most carpet yarn dyers prefer to use, whenever possible, straight types of dyes in preference to making mixtures, but it so happens that in many instances the shades selected by the designer are such that few straight dyes will suffice, and the dyer must then match his shades by compounding. The necessity calls for skill in dyeing of the very highest order. It is the aim of the dyer to co-operate to his fullest extent, with the designer, having in mind that the designer is the artist creating the pattern, and that the dyer is engaged in finishing one of the necessary parts of the completed work.

The choice of dyes for carpet and rug work need not be very extensive. A well-selected range of base colors, with an assortment of shading colors, will usually meet the demands imposed on the dyehouse by the designer. Of course, not all dyers work alike; some deem it necessary to carry a rather full line of dyes, but during the past twenty years the tendency has been to keep the number of individual types down to a minimum.

With a line of about twenty dyes, including black, scarlet, reds, blues, green, yellow, oranges, violet, rose, with a complement of dyes for shading, the dyer is usually able to duplicate any shade used in the pattern.

A Useful Publication

In this connection, one of the most important contributions to the literature of practical textile coloring is the recent publication of the National Aniline & Chemical Company, Inc., treating on the dyeing of carpet yarn. This work shows a very complete series of thirty-six shades representing twelve dyes, followed by type dyeings of eighteen additional dyes, giving the dyer of carpet and rug yarns a wide range to choose from. In addition there is a most useful group

of twenty-seven compound shades that in a most practical manner, show the desirable mixtures for producing mode tones and other effects. These dyeings are all shown on actual pieces of carpet, and woven from yarn that was dyed in practice. Finally, a selection of thirty colors is given on yarn, thus enabling the dyer to form some idea as to how his dyeings will appear before going to the loom.

Carpet yarns may consist wholly of wool, or they may contain admixtures of wool and hair as used for the cheaper grades. Where hair is used in the mixture, the choice of dyes should include those that are easily leveling, and are applied by means of sulphuric acid and Glauber salt. This is generally necessary because hair, being less easily penetrated than wool, is likely to be left in only a partially dyed condition.

From the scours, the yarn should be bleached or sulphured. It is almost impossible for the dyer to produce clear shades unless the material is as white or light colored as possible. After scouring, the rinsing should be so thorough that no traces of soap remain in the wool. While the rinsing may not be as perfect as for piece goods, it should be so well done that all soap is removed. The chief reason for this is that any traces of soap remaining in the wool will be decomposed when the yarn enters the acid dye bath, causing a separation of the free fatty acid which adheres to the wool. When the carpet is made, if such fatty acid is in it, it will cause a softening of fibers and thus be responsible for footprints, etc. In other words, the wool in the yarn loses its elasticity.

Scouring

The first important treatment of carpet yarns is scouring. As a rule, the oils used in the picker house for this class of material are not of the same high quality as are usually employed for finer wools, and consequently their removal requires a somewhat more drastic treatment. Most carpet yarn scourers employ a strong soap solution frequently fortified with soda to ensure the complete removal of the oils, but as often fail to wash or rinse the yarn afterward, as thoroughly as they should, the result being that appreciable quantaties of soap remain behind. Strong soap solutions of the kind mentioned are not absolutely detrimental, provided the temperature of scouring is kept below 120 deg. Fahr., but with the presence of soda, the yarn is liable to become somewhat harsh.

Only sufficient soap should be used in the yarn scours to effectively remove the oils at the indicated temperature and allowing proper time for the soap to do its work, conditions that require some experience and exercise of judgment. The main object being to deliver a clean yarn to the dyer, free from oils and soap, and without any injury to the wool.

Slow Dyeing Essential for Ground Colors

Level shades for ground colors are an absolute necessity, and for their production, slow dyeing should be resorted to. Any attempt to push the dyeing operation will only result in unevenness. The use of level dyeing dyes is recommended for the purpose, and the operation carried out with from 4 to 6 per cent of oil of vitriol and 20 to 25 per cent Glauber salt. The dyestuff may be previously dissolved and added to the bath, the temperature brought to about 175 deg. Fahr., the yarn entered, and afterwards raised to the boil and boiled to shade. For standard colorings, the dyer may fix his formula, but even then, he will have to pass judgment on each batch. When dyeing in revolving yarn kettles, the dye solution is added directly to the bath as soon as the temperature reaches 175 deg. Fahr., after which it is raised to the boil, and boiled to shade.

Oriental shades, nearly all flat colorings, possess a peculiar charm in carpets that is greatly enhanced by the luster of the wool. These shades as they exist in genuine Oriental productions, are chiefly the result of artistic and weaving skill while the technique of the dyeing is secondary.

Oriental Dyers vs. Modern American

Facts gathered from various sources and confirmed by travelers from those regions where such carpets are made, show that the dyer makes no effort to match his shades with any degree of accuracy. This accounts for the frequently noticed unevenness in the ground colorings. Several large rugs of excellent material recently examined show distinct differences in shades of design elements that would otherwise be made absolutely uniform in a carpet of modern manufacture.

The actual dyeing of carpet yarn is carried out in either the old-fashioned open tubs, in rotary dyeing machines, or in machines that are constructed to give to the yarn the same motion that it has when dyed in open tubs. It must be said that with ordinary good labor and careful supervision, the open tub method has never been excelled for the quality of the work turned out, but the improved types of machines have made possible a greater unit output of dyeings of very high quality. Formerly, when the old open tubs were exclusively used, handling the yarn was a very laborious matter; the worst feature was the constant turning of the yarn on the sticks, and the occasional "lifting" towards the end of the dyeing to permit the additions of whatever shading colors were necessary.

The National Chemical Products Company, Union, N. J., has been incorporated with a capital of $125,000, to manufacture chemicals, dyes and kindred products. The incorporators are Joseph C. Bender, Newark, N. J., and Richard D. Zucker, Mount Vernon, N. Y.

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

President
LOUIS A. OLNEY
Lowell Textile School, Lowell, Mass.

Vice-Presidents
WILLIAM D. LIVERMORE WILLIAM H. CADY

Secretary
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Councilors
ELMER C. BERTOLET GEORGE A. MORAN
ARTHUR E. HIRST WILLIAM K. ROBBINS
WALTER M. SCOTT

LOCAL SECTIONS AND THEIR OFFICERS

Northern New England Section—
Hugh Christison, Chairman, Arlington Mills, Lawrence, Mass.
A. K. Johnson, Secretary, Lowell Textile School, Lowell, Mass.

Rhode Island Section—
Ralph F. Culver, Chairman, Box 269, Providence, R. I.
Leslie L. Bamberger, Secretary, U. S. Finishing Company, Providence, R. I.

New York Section—
P. I. Wood, Chairman, Oriental Silk Printing Company, Haledon, N. J.
L. C. Lewis, Secretary, 95 Madison Avenue, New York City.

Philadelphia Section—
Robert E. Rose, Chairman, E. I. du Pont de Nemours & Co., Wilmington, Del
Elmert C. Bertolet, Secretary, Philadelphia Textile School, Philadelphia, Pa

Second Annual Meeting

Held at Hotel Pennsylvania, New York City, Saturday, December 2, 1922

AFTERNOON SESSION

The meeting convened at 2.15, President Louis A. Olney presiding.

President Olney—Our business session is called to order.

As you understand, the governing body of the Association is the Council, and for that reason a very large proportion of the business can be handled by them. In order to facilitate matters to-day we have condensed our business into as short an order as possible.

Our first business will be the report of the Secretary, Mr. Hadley.

. . . Secretary Hadley presented his prepared report, as follows:

SECRETARY'S REPORT

The desirability of some form of organization of American Textile Chemists and Colorists had been recognized for some time, and on August 26, 1921, a meeting was held in Boston with the object of discussing such a formation. The opinion of those who attended the Boston meeting was unanimous that such an organization could be formed and fill a real need, and the organization meeting was held in Rumford Hall, Chemist's Club, New York City, on September 13, 1921, which was succeeded by the Inaugural Meeting held in Boston on November 3, 1921.

The Association at the present time consists of 398 members, of whom 265 were charter members. Ninety-four active members and thirty-nine junior members have been added during the present year. Two charter members, James L. Amsden, Councilor from the New York Section, and John Quin, Secretary of the New York Local Section, have died during the past year.

The Council has held ten meetings in Boston, and one informal meeting in New York City during the week of the Chemical Exposition.

The Research Committee has held nine meetings and has considered "Fastness Tests Upon Cotton, Wool and Silk." Work has also been performed relative to establishing standards of fastness to light. The fastness tests as applied to bleaching are also well under way.

Local Sections have been organized as follows:

Northern New England Section, Boston—Chairman, H. Christison; Secretary, A. K. Johnson; Treasurer, M. R. Moffatt.

Rhode Island Section, Providence—Chairman, R. F. Culver; Secretary, L. L. Bamberger.

New York Section, New York—Chairman, P. J. Wood; Secretary, L. C. Lewis; Treasurer, H. F. Wilmot.

Philadelphia Section, Philadelphia — Chairman, Dr. R. E. Rose; Secretary, E. C. Bertolet.

Respectfully submitted,
W. E. HADLEY, Secretary.

President Olney—You have heard this report. Are there any corrections? If not, it will stand approved as read.

Next we will have the Treasurer's report, by Mr. Durfee.

. . . Mr. Durfee presented his report as Treasurer, as follows:

TREASURER'S REPORT

FOR YEAR 1922

Received from dues		$1,885.00
Expenses: Organization	$162.40	
Administration	549.97	
Sections	125.00	
Journal	545.00	
		1,382.37
		$502.63
Interest and exchange		12.09
Balance on hand		$514.72

President Olney—Gentlemen, you have heard this report; are there any corrections? If not, it will stand approved as read.

Our next business is the election of officers for 1923. The system adopted for elections, as you all know, was to send out a blank ballot for nominations to every active member. When these were returned, all names nominated on ten or more ballots were placed on the final printed ballot which was sent to every active member. Each member was supposed to mark his ballot and put it in a sealed envelope with his name signed upon the outside. The majority did that. But we have some twenty (I think twenty to twenty-five) which were returned in a sealed envelope without any signature on the inside envelope or the outside envelope. We must either reject these or accept them as a group, and rather than rule on that myself I thought I would leave it to the Association to decide whether these twenty to twenty-five votes, which are not wholly in accordance with our Constitution, shall be rejected or accepted. What is your pleasure in regard to that? They must, of course, have been sent by some members, because we only sent the blanks to members, and unless someone deliberately took a blank (which we won't assume that he did) I suppose they are perfectly straight votes.

Mr. Moran—I move that they be accepted and counted.

. . . The motion was duly seconded by Mr. Robbins, and carried.

President Olney—We shall have to have some tellers to look these over. I think it will be a comparatively simple matter, and I am going to appoint Mr. Davies, Mr. John Culver and Mr. Fisher to act as tellers to examine these ballots and report to us as soon as they can the results of the election.

Our most important business this afternoon is the action on the proposed amendments to the Constitution, which are printed on the last page of your program. I think it will be best to take these up separately and vote on each one. Then, if there is any objection or comment upon any one of them it will not complicate matters later, as it would should we attempt to vote on them all at one time. I will read them separately.

Number 1 refers to the Article defining the qualifications for active membership and recommends that it be so changed as to read: "The applicant must be engaged in or directing work related to the application of dyestuffs, etc." It originally simply said, "engaged in." As a result of that particular clause, it has been necessary, in order to live up to our Constitution, at times to reject applications which I know the Council as a body would have been glad to accept. But we simply had to draw the line in accordance with what the Constitution told us to do. We felt that in practically all of those instances the men while they were not actively engaged in the application of dyes were directing work along that line, and with that in mind the Special Committee on Changes of Constitution makes this recommendation.

Is there any discussion with regard to this amendment?

Mr. Busby—Mr. Chairman, with regard to the proposed amendment, it seems to me it will not let down the bars, but that perhaps our purposes will be set at naught in this Society, if we allow to become members of it men who are simply directing work. Does it not leave the Society open entirely to executives who have no knowledge of the situation whatever; plant managers, for instance?

President Olney—That is, of course, still left to the Council. I think the Council in acting upon any application will take into consideration very carefully the qualifications of the applicant. I might give a specific illustration. For instance, there might be a man who had been engaged for twenty years more or less, we will say, in the application of dyes, and who might know more about the application of dyes than many members of the Association. Yet, assuming that that man became purely an executive, according to our constitution he would not be eligible to membership, even though he might make one of the most valuable members we could have.

Let us take another illustration. Here is a man who is the manager of a dyestuff company; he knows very little about the application of dyes; he is purely a busines-

man. I think the Council would have no difficulty in deciding whether he was actually eligible or not.

Mr. Livermore—Mr. President, I think the question can be answered a little more directly perhaps if you will remind the inquirer that this does not change the qualifications of the applicant; he is obliged to have had the training and the experience in the application of dyestuffs just the same as before. But because a man has been promoted to an executive position we don't want to deprive him of the privilege of being a member. This amendment doesn't let in anybody who hasn't had chemical training and practical experience in accordance with our rules for qualification.

President Olney—In other words, a man must have had five years' actual experience in the application of dyes.

Mr. Busby—I wasn't thinking of that so much, in answer to Mr. Livermore's explanation; I was thinking more of the man who has had such experience and then has taken up another line of work, although he is still actively interested in it; his qualifications would fit him for membership, but he is neither engaged in nor directing work in the application of dyestuffs, although he is very closely connected with it.

President Olney—Do I understand that you think this change is not broad enough?

Mr. Busby—Yes. I should say, as I see it now, let the thing go; let the qualifications of the applicant rather than the specific type of work he is doing govern it.

President Olney—If we leave the Constitution as it is, it states definitely "engaged in"; unless we modify it, we still have our hands tied, the same as before.

Dr. Walter M. Scott—Mr. Chairman, in order to bring this matter before the meeting—I don't know just what the procedure is, but I presume it calls for a motion—I move that this amendment be accepted.

. . . The motion was seconded by Mr. Wingate and carried.

President Olney—Amendment Number 2 refers to Article III, Paragraph 4, which shall read as follows:

"Any Corporation which is interested in the work of the Association may at the discretion of the Council be admitted to a corporate membership which shall entitle it to all the privileges of active membership with the exception of voting."

The next amendment bears on this one; it is an amendment to Article VI, Paragraph 2, which shall read:

"Annual dues for corporate members shall be optional with the applicant—a minimum of twenty-five dollars being required."

There are certain reasons why these two amendments have been proposed. We have already had a number of applications for corporate membership. This evening I may say a few words about some of our hopes in regard to research work. If we carry on any research work at all of an extended type we shall require funds with which to do it and this may be one of the means by which such funds can be raised. There seems to be a feeling on the part of the Council that they do not wish to unduly raise the membership dues for active members at the present time.

What is your pleasure in regard to this change in the Constitution? Is there any discussion?

Mr. Howes—Mr. President, I would like to ask what the construction will be, with regard to corporate memberships, as to the designation of an individual of that corporation; or will any member of that corporation be free to take part in any of the activities of the Association?

President Olney—I should say that anyone delegated to act for the corporation would be the representative. There will be no objection to their sending as many as they wish to, to attend a meeting.

Is there any further discussion?

Mr. Christison—Mr. President, I think these amendments should not be adopted. I think that what we should do is this: plan a certain definite line of work and then ask the corporations to contribute to that. I think they would do it. It might savor of a hold-up game if you asked the corporation to become a corporate member, whereas if you have a definite program and want to accomplish a definite end—want to make a definite investigation—I think you could approach them with that in mind and they would contribute.

President Olney—Are there any other remarks?

Mr. Moran—Mr. Chairman, I think there is a definite demand for corporate membership. A certain number have already applied for membership and I can't see any objection to allowing them to become members of the Association. It is quite a common practice in organizations of this kind to have corporate members. That will allow them to contribute to the support of the organization in anything they see fit. We don't have to ask any corporation to become a member if we don't want to. We merely allow those who apply for membership the opportunity of becoming members.

To put the matter before the meeting, I move that this amendment be accepted.

. . . The motion was duly seconded by Mr. Hirst and carried.

President Olney—Number 4 refers to Article VIII, which it is proposed to amend to read: "If for any reason the official ballot shall fail to elect the entire number of officers and councilors, any vacancies shall be filled by special election at the annual meeting."

This provision was made, perhaps, under undue fears. We were afraid that some time a condition might arise where members did not take sufficient interest in returning the ballots, to have a sufficient number to elect some particular officer. I think by the pile that the tellers have, we need not worry very much in that connection, but in order to make the Constitution complete in its working mechanism, as you might say, the Committee seemed to think this change was desirable.

Is there any discussion with regard to this amendment? If not, the Chair will entertain a motion to adopt it.

Mr. Hirst—I move that it be adopted.

. . . The motion was seconded by Dr. Pratt and carried.

President Olney—Number 5 refers to Article XV, where it is suggested that the duties of Local Secretaries be more clearly defined, and that the third paragraph be reworded as follows:

"The Local Secretary shall submit to the secretary of the Association an Annual Report of the proceedings of the Local Section each year, before February 1 of the succeeding year."

Apparently that was thought necessary to again complete our working mechanism. It seems quite desirable that the Local Sections shall be closely tied up to the work of the general Association, and that is one way of bringing that about. If it is put into the Constitution, it makes it mandatory on the part of each Local Secretary to make some sort of a report, and he knows it from the fact that it is one of the By-laws. Without that, there is no special obligation on the part of the Secretary to report; that being the case, in many instances it might not be done, and, furthermore, the General Secretary would not have the authority to call upon him for a report in case he did not return one. It was with that in mind that this amendment was proposed.

Is there any discussion with regard to this?

Mr. Robbins—Mr. Chairman, I move that Amendment Number 5 be accepted as an amendment to the Constitution.

. . . The motion was duly seconded.

Dr. Scott—Professor Olney, the only question with regard to it is whether there would be some advantage in having the date of the report coincide with the date of the annual meeting.

President Olney—I thought of that myself as I read it over. Is Mr. Livermore here? I might state that Mr. Livermore is the Chairman of the Committee on Constitution and Amendments.

Mr. Livermore—I accepted this amendment as Mr. Cady offered it originally. But I see no reason why it shouldn't be changed as Dr. Scott suggests, personally.

President Olney—How would it be if it read, "Previous to the annual meeting," or something of that kind? Then that report would be in, for the General Secretary to make up his report in accordance with that.

Mr. Livermore—I presume the difficulty was that if he was obliged to submit his report at the time of the annual meeting he might not be able to submit a complete report of the Section at that time. However, I see no reason, if it is desirable for the purposes of the annual meeting to have those reports in before the annual meeting, why we shouldn't change that in accordance with that view.

President Olney—If that is changed to read "before December 1" it will cover it, I believe, because our annual meeting comes in December.

Mr. Livermore—Then make it read "proceedings of the Local Section each year before the date of the annual meeting."

President Olney—The only question is whether it would not be more definite to make it December 1.

Mr. Livermore—Then make it read "December 1 of that year."

President Olney—That is all right. Mr. Robbins, do you accept that amendment to your motion?

Mr. Robbins—Yes.

President Olney—The motion then is made by Mr. Robbins, seconded by Dr. Hollander, that we accept the amendment, with the change suggested. All those in favor say "aye," opposed "no."

. . . The amendment as changed was adopted.

President Olney—Number 6 is an amendment to the last paragraph of Section VI, which will read: ". . . within ten days of the holding of said meeting."

Do you remember offhand, Mr. Livermore, just what that refers to?

Mr. Livermore—No.

Dr. Scott—As I recollect it, that was with regard to the reports of meetings of the Local Sections to the Secretary of the Association; Mr. Cady had the idea that there ought to be some time limit within which those reports should be sent in after the meeting of a Local Section.

President Olney—Oh, yes. This refers to the reports of the Local Sections. For instance, a Local Section has a meeting to-night; this provides that within ten days the Local Secretary must send a report of the meeting to the Secretary of the Association. We find that is quite essential in order to keep our proceedings up to date. The members are not nearly as interested in the report of a meeting that was held two months ago as they are in one that was held two weeks ago, and I think we will all agree that in most instances the Secretary can write up a report

of that meeting better in ten days than he can two months later. Apparently, for that reason, the Committee thought it would be well to make this recommendation.

Is there any discussion in regard to that change? If not, the Chair will entertain a motion.

. . . It was voted, upon motion of Mr. Culver, seconded by Mr. Busby, to adopt Amendment 6.

President Olney—Number 7: "The Council may at its discretion offer prizes for the solution of textile problems, under such conditions as it may see fit to impose; and the Treasuder is authorized to furnish for this purpose from the funds of the Association an amount not exceeding $100 annually."

I might say that this suggestion was made by Mr. Cady, one of our Vice-Presidents, who on account of sickness unfortunately cannot be with us to-day. I was hoping he would be here so that he could say something further in regard to that.

You may know that it has been more or less of a general policy of foreign associations to offer prizes of this kind, and if any of you are members of the British Society of Dyers and Colourists and receive their Journal regularly you will remember that quite frequently in the front pages of that Journal there is published a rather long list of suggested subjects for which various prizes in the way of medals or money are offered for satisfactory solutions. You may also have noticed that that same list is published year after year without apparently any solution to many of the problems. (Laughter.) But I don't see that that interferes with the principle in any way.

Is there discussion with regard to that? I would like to hear from you if you have any views in favor of it or against it, so that we may have both sides in mind before we vote. If there is no discussion I am ready for a motion.

Mr. Wingate—Mr. Chairman, I move the amendment be accepted.

. . . The motion was duly seconded by Mr. Hirst.

President Olney—Those in favor of the motion say "aye," opposed "no."

. . . The motion to accept the amendment was carried.

President Olney—We should have reports at this time in regard to various other committees. Our Research Committee is by far the most important Committee, but it has been thought well to defer action in regard to our work until later. You will notice in our program for this afternoon under heading Number 4 there is to be a discussion of fastness tests as proposed by the Research Committee, and I think, in fact I know, the Research Committee would not wish any action taken on the acceptance of any of these methods until the Association, in their annual meeting, has had full opportunity to discuss them in every way. So, if there is no objection, we will defer action in connection with the Research Committee to some other time.

Are the tellers ready to report? The tellers, I understand, will be ready to report the elections in a very short time. In the meanwhile, the meeting is open for any further business that may rightly come before it. If there are any matters which any of the members wish to present, this is the time to do it.

Mr. Busby—Mr. Chairman, is the Secretary prepared to give us figures as to the relative types of membership, as to who are dyestuff men, who are textile men, and so on?

Secretary Hadley—No, not at the present time. But we are contemplating the publication of a year book during January, I believe, and that is one of the subjects we are going to cover at that time.

President Olney—Does that answer the question?

Mr. Busby—Yes, very fully.

President Olney—Is there any further business to come before the meeting? If not, I will report the result of the election: there were 200 votes cast. There is no statement in regard to official officers, but the tellers state that all of the retiring officers were re-elected for another year; that is, the executive officers. As to the councilors, there were three names on the list and the vote stands: For Dr. Scott, 145; Mr. Moorhouse, 126, and Dr. Kilheffer, 57. So I declare Dr. Scott and Mr. Moorhouse elected as councilors for the coming three years.

If there is no other business, I think we will proceed with our regular program for this afternoon. We are ten minutes ahead of time, but I think that is so much to the good. We will not wait ten minutes in order to begin, because we may need that ten minutes at the other end.

The first number on the program is "Discussion of Pressure Machine Dyeing, with Special Reference to Beam Dyeing." This is one of the subjects that were suggested through our questionnaire. It seemed to appeal to a number of the members. J. W. Eich has consented to open the discussion upon this subject.

. . . Mr. Eich presented his prepared discussion on this subject, as follows:

DISCUSSION OF PRESSURE MACHINE DYEING, WITH SPECIAL REFERENCE TO BEAM DYEING

By J. W. Eich

Pressure machine dyeing came into prominence in this country some twenty-five years ago.

The first machines were designed for the dyeing of raw cotton, and are quite generally used for this purpose

to-day. Briefly described, these machines consist of large circular or rectangular tanks into which the cotton is evenly packed, and secured by bolting down a perforated cover. The tank is connected with a centrifugal pump which circulates the dye liquor through the cotton at a pressure of from 8 to 10 pounds. Depending on the size of the machine, from 500 to 1,100 pounds of raw cotton can be dyed at one time.

The advantages of this method of raw stock dyeing over the older methods are, that the stock is left in much better condition for subsequent operations, economy in dyestuff is in some cases effected, and many colors may be dyed in these machines which cannot satisfactorily be dyed by the older methods. It was in pressure machines that the anthraquinone group of vat dyes were first successfully dyed on raw cotton.

More recent machines of the pressure type are the Franklin and the beam dyeing machines. The Franklin machine is designed to dye cotton and worsted yarn, and may also be used for the dyeing of raw cotton. For dyeing in this machine the yarn is wound on cloth-covered springs about 6 inches long; a number of these tubes are mounted one above the other, after which they are compressed and securely placed over the openings through which the dye liquor enters. The circulation of the dye liquor usually proceeds from the inside of the tubes at first, and then is reversed, circulation being reversed at stated periods until the dyeing operation is completed. This machine satisfactorily dyes most of the vat and other fast colors.

The beam dyeing machine, as its name implies, is designed to dye loom or slasher beams. There are several types; some dye one or two beams placed horizontally in the machine. The larger types dye as many as six or eight beams placed perpendicularly inside a circular tank. The principle of dyeing is the same in all cases, the dye liquor being forced through the yarn from the inside of the beam for a certain length of time, when it is reversed to circulate from the outside. The circulation is continued until the dyeing is considered completed, when the dye liquor is drawn off. Subsequent operations depend on whether the color used requires oxidation or an after-treatment before finally washing. Provision is also made for extracting and drying the yarn on the beams.

The economy in operations, time and spaces effected by the use of beam dyeing machines is quite generally appreciated. But, in common with all dyeing machines, this machine seems to have its limitations—first, in the number of colors which may be dyed successfully; second, in the depth of shade a given color may be dyed without sacrificing fastness. Further, it has been found to be a difficult matter to obtain consistently the same result with any given formula. Mechanical difficulties in the form of leaky valves, insufficient solubility and other causes seem to contribute to uncertain and aggravating results. So that many questions and problems still confront those who are interested in the use of the beam dyeing machine. The discussion of some of these questions, such as why it is difficult to obtain the same finish on ginghams made from beam dyed yarn as when the yarn is dyed by the long or short chain warp system; why shades produced in the beam dyeing machine with any given color are invariably duller than shades produced by the same color dyed on long or short chain warps should be of interest. It may also be interesting to discuss the question as to whether the beam dyeing machine in its present state of development is adapted to the requirements of a high-grade gingham mill.

President Olney—You have heard this paper read by Mr. Eich, in which he has laid down very clearly the fundamentals of machine dyeing. I am sure that Mr. Eich will be glad to answer any questions that are asked, if he can do so from his experience, and I hope that you will open the discussion among yourselves. To my knowledge, there are a dozen men here who are more or less well experienced in machine dyeing, and I imagine among that dozen are men who might be considered the experts of the country. This is a good opportunity for discussion either by those who are looking for information or those who wish to impart it on the other hand. Remember that we are here as an Association, all interested in these various things, and when any of us do something to help the others it is right along the lines of the fundamental objects of our Association.

Don't all speak at once, but we will be glad to have someone start it. Mr. Robbins has had a good deal of experience, and I think he might be able to tell us something about his experience and ask a few questions.

Mr. Robbins—Mr. Chairman, I am very reluctant to pose as an expert on machine dyeing, although I confess to having had some experience in it.

It seems to me the greatest problem confronting the party undertaking beam dyeing is the adjustment of the solubility of the dyestuff and the manner in which the cotton attracts, presuming that you are working on cotton. It sometimes happens that your color may be sufficiently soluble, but the goods so attracts the color that it dyes the first portions that it comes in contact with, and the other portions are not dyed to the same depth and sometimes not to the same shade, especially if you are using a compound color. That applies to beam dyeing,

the Franklin Process dyeing and to the raw stock dyeing; it is the same in all.

The point that we find is of the greatest importance is to adjust that solubility and attractiveness so that the color will not be taken up by the fiber until the circulation has had time to force it clear through the whole mass; and where that can be adjusted, the dyeings come out very satisfactory, and we have dyed almost all the colors on almost all of those machines.

The vat colors on beam dyeing machines are proceeding very well, so that they can be woven in a solid pattern with warp on the face, and not a sweeping warp. That did not happen with the first dyeing, you can be assured, but some later dyeings have proved that way; and we have succeeded in handling Indanthrenes and Sulphur Colors. It seems to me that is the most essential thing.

The peculiarity of the shade made on the Franklin and the beam dyeing machine (it coming out duller than when made in the other way) is something I found no explanation for that was anywhere near satisfactory. Take such things as Di-Brom Indigo dyed in the vat—it is immensely brighter and a finer shade than the same material right out of the same barrel of dyestuff on either the Franklin or the beam dyeing machine. It comes out brighter and much better dyed on the stock machines than it does on these machines that are handling yarn, and the explanation for that is something we would like very much to learn.

There is a little difference in the effect it has on different colors. The Indanthrenes come out very well on the beam machine. With Midland Blue or Di-Brom Indigo—you would not think it was the same color. And if somebody can explain it—and I hope somebody will—it will be a great help to a large number of people who have these machines.

I don't think of anything else I would like to say.

President Olney—Is there anyone who can answer that question of Mr. Robbins'?

Mr. Lehmann—Mr. President, I have been studying the question. I made a great many experiments in beakers with colors and have watched the effects of different metals in different concentrations on the color of the fiber, and I found that by taking, for instance, a 5-gram piece of worsted yarn in a solution of 500 c.c. of water and of dyestuff, the effect of the metal, either copper or iron, in the slightest amount was much less than when the liquor was a concentration of perhaps 5 grams to 100 c.c.

On the machine dyeings, we have, especially in the Franklin Process machine, 1 gallon of dye liquor to 1 pound of material. Therefore, the concentration of the dye liquor is enormous, compared with the old way of dyeing. When we figured in the old wooden tubs and dyeing the raw stock, we used to use somewhere from 20 to 25 gallons of liquor to the pound of material—and I believe that is one of the subjects which ought to be thoroughly investigated.

I have also taken the piece of iron and coated it with material of the type of the formaldehyde phenol compounds, and of course found that the difference was not there at all. I believe that the metallic salts of the different dyes, especially in different concentrations, play an enormous part in the final results.

Mr. Wingate—One matter Mr. Robbins spoke about was the dullness of the shade. I don't quite agree with him on certain dyestuffs. In certain cases the dye doesn't seem to work in the machine as well as others, but there are some cases in which it is just as good; and while the shade may not look as bright when it comes out of the machine, after the goods are finished and soaped that brightness is as good, if not better. Also, the penetration is very good. The yarn is penetrated through and through.

Mr. Robbins—Mr. Chairman, in reply to that I would say it has not worked out that way. The finished goods are nowhere near—I refer now to Di-Brom Indigo—as bright as the vat dyes, and it doesn't make any difference how long you expose it. They are very much improved by boiling soap, but in that case nowhere near correspond in brightness to vat dyed yarns.

As to the concentration, which was mentioned a moment ago, the peculiarity of that is that there is a limit to the light shades that can be produced. It is not safe to undertake to dye too light a shade on any of these beam dyeing machines. That means, if you have not a proper concentration you can't get a level dye. On the other hand, the explanation for it is that you have not adjusted your solubility in such a way; but where you only have a very small amount of dye present, the first portion of the fiber takes it all up before it arrives at the next portion of the fiber. So that the concentration which Mr. Wingate refers to would hardly hold in these cases, I think.

Mr. Eich—In the case of the Indigoid dyestuffs, Mr. Robbins, wouldn't the dullness be attributable to insufficient oxidation in the machine?

Mr. Robbins—No.

Mr. Eich—For instance, warp dyeing—the yarn gets considerable oxidation going up and down, whereas in machine dyeing you don't get that at all; you hold off your liquor and you blow air through.

Mr. Robbins—As to the oxidation, that has been tried very thoroughly, first by long blowing of air through these machines, especially beam or Franklin Process; but that didn't seem to do it.

Another treatment is to be sure to oxidize with pure bichromate of soda.

Mr. Hanna—From my observations, in comparing beam dyeing and package dyeing with raw stock dyeing and long chain dyeing, it is a case of penetration and luminosity. For instance, with raw stock dyeing: the fiber is penetrated to the core. In beam dyeing and package dyeing, the yarn is penetrated to the core. Therefore, there is dyestuff right through. As I say, it is a case of equal penetration. But for chain warp dyeing, you will notice it is just an outer layer of dyestuff and the center of the fiber is white and undyed. Therefore, there is a reflective power and increased luminosity with the chain warp dyed yarn that there isn't with the raw stock and beam dyed yarns. If you put a piece of raw stock spun yarn—that is, raw stock dyed and then spun and beam dyed—under the microscope you will notice it is penetrated thoroughly, while a piece of yarn that has been chain dyed, even with a successive number of passages, is just coated on the outside, and you can see the undyed fibers in the center, which naturally reflect light and make it much brighter. And I think, from my observations, that is the answer to that problem.

Mr. Robbins—I have no desire to take up all the time this afternoon, but there is one trouble with that: Why is the shade so much brighter dyed in the stock than in the yarn, one on the yarn dyed machine and the other on the stock dyed machine? The shades of the same dyestuff come out brighter on the stock than they do on the yarn. They are both equally well penetrated.

Mr. Hanna—I don't think that holds true in all cases; especially as it can be overcome by the use of a softening agent, like a soluble oil in the stock. That gives you more luminosity and that helps to bring it nearer the chain dyed results.

Mr. Eich—It seems that the theory of luminosity would hardly explain the great differences obtained between beam dyed Indigoid shades and yarn dyed Indigoid shades, because the difference is too great.

Mr. Wingate—One more point, on the duplication of the shades: Mr. Robbins said there was great difficulty in duplicating the shade in the machine, the formula being the same. I have found it has been pretty easy to duplicate shades. You can reduce your caustic and hydro, and you should have that reduced to as low a point as you can, for the benefit of your color.

Mr. Robbins—Mr. Chairman, I guess the gentleman must have misunderstood me. We haven't had any difficulty in reproducing the same shade on the same thing, but the trouble was to get that shade as bright as we wanted it on something else. We do reproduce the same shade on the same weight of yarn without difficulty.

President Olney—Are there any further questions? So far we have discussed nothing but cotton. Is there anyone here who is willing to offer some information about dyeing of wool in these machines? I think there are many here who would be interested to receive information in regard to top dyeing or yarn dyeing in a machine.

Mr. Thompson—I was a little bit late getting into the discussion on that cotton dyeing affair, but I would like to say something in regard to that. Of course, you know in the open machine you have a greater source of oxidation. It will require a larger amount of hydrosulphite and necessarily a larger amount of caustic soda to do your dyeing. With your caustic soda you will find, if you use more of it you will get a brighter shade than you would if you used a smaller amount. That may explain it because of the fact that in your machine dyeing you do not require as much caustic soda to keep the vat in condition; hence, you are not using enough caustic soda to keep the shade as bright as it should be.

Mr. Robbins—Mr. Chairman, I think we make very little difference in the amount of caustic soda we use one way or the other.

If you will permit me, I will venture a little explanation of why some of these things may be. The proportion of caustic soda doesn't seem to account for it.

There is one explanation that some of you people who are better posted on physical chemistry than some of the rest of us may be able to give. By the way, we have dyed worsted tops on these same machines, and with success; the same conditions apply to dyeing wool that apply to dyeing cotton: if there is that solubility and attractiveness to the fiber you can get level shades.

A possible clue or explanation is that the vat colors, or some of them at least, do not come so bright if oxidized while they have considerable caustic soda present. With the dyeing machine, it is impossible to extract or air them, and they must depend wholly upon the small amount of oxygen that is carried to them by the rinse water, and it is a question as to whether this caustic soda isn't so well rinsed out by the time the oxidation takes place that you can avoid the possibility of dulling the shade by having the oxidation take place when the caustic soda is present.

That is just offered as a suggestion, to see whether or not it will correspond with something that some of the rest of you know better about than I do.

Mr. Moran—Mr. President, there are one or two points about the beam dyeing that I should like to mention. One is that the consumption of dyestuffs seems to be very much greater than in the chain dyeing of the same shade.

Another point is in regard to the covering of neps and motes (dead cotton) that appear. There seems to be greater difficulty in getting these covered in the case of beam dyeing than in chain dyeing. I wonder if anyone

can give any explanation as to why these do not cover as readily in beam dyeing? This applies particularly on cotton yarn.

President Olney—Can anyone answer that question as to why it is that, in machine dyeing, neps and motes and so on are not as well covered as in the ordinary open machine dyeing? Mr. Robbins looks as if he would like to say something.

Mr. Robbins—I would just like to say I verified his experience about the neps and motes, and I am also very desirous of having somebody explain the reason for it.

As to the depth of shade, I think we get fully as deep a shade with, say, Di-Brom Indigo on the beam machine as in the vat. The only difference is in the brightness. I think it requires a little bit higher percentage, if anything, in the vats than it does on the beam machine to get about the same depth, but you must take into consideration that that doesn't have the same brilliancy. Naturally, you would expect it would take more dyestuff where you force the thing entirely through the yarn than it would when you put it on the surface, like in the vat; but for some reason I can't fully explain, we do get with the same percentage of dye quite as deep a shade on the beams with, say, Di-Brom Indigo as we do in the vat. But we have that difficulty in covering the motes with the various dyestuffs. That fact is rather more pronounced, I believe, with Sulphur dyestuffs than with some of the Vat dyestuffs.

Mr. Moran—My impression is that sulphur black will take nearly 50 per cent more dyestuff to obtain the same shade with the beam dyeing than you would use in chain dyeing; in other words, you would have to use pretty nearly half as much again. I don't know that that is as pronounced on other sulphur shades as it is on black, but the quantity required for black seems to be very much greater.

Mr. Wingate—I cannot speak on the beam dyeing, but I can say on the Franklin dyeing that we use less dyestuff on blacks than we used before.

President Olney—There seems to be quite a difference of opinion on that point. I can see no reason why there should be any difference between the beam dyeing and the Franklin, both having exactly the same principle involved, unless you use entirely different strength of dye solution.

Mr. Moran—I think in beam dyeing you would naturally expect to use more dyestuff because the yarn is penetrated through and through, whereas in chain dyeing most of your dyestuff is on the outside. Chain dyeing is really a succession of padding operations.

President Olney—But Mr. Wingate is referring to the Franklin Process, which ought to give practically the same penetration. I think there is a point that might be investigated.

In order to cover our afternoon program, we cannot spend too long a time on any one subject; and while there may be other information that is of value, I think we had better pass on to Number 2, "Methods of Determining the Strength of Dyestuffs," this discussion to be led by Dr. R. E. Rose.

Dr. R. E. Rose—Mr. Chairman and Gentlemen: Those in charge of the program saw fit to ask me to lead a discussion on the subject of dye testing, in particular with regard to the determination of strength. Perhaps they realized that, being in charge of the dye testing laboratory of a dyestuff manufacturer, I am always discussing the subject, not so much for love of the subject but because those whom I deal with are constantly trying to persuade me that the human eye can't judge dyestuffs at all. I think we who are responsible for standardizing color certainly are aware of the fact that this subject is one lending itself to discussion, even to acrimonious discussion.

If you will permit me, although I am going to try to keep to strength of dyestuffs, I want to outline just a little bit the whole field of relative properties of dyes so as to mark out the strength tests in particular.

The textile man uses dye testings to determine the right color to purchase. His color program is dependent on his own dye testing, which is his own check on the claims of the maker of dyestuffs, with regard to strength, shade and the other properties. But there is another side which those of you who are in the textile business do not see, and that is that the production of the dyestuff manufacturer is regulated very largely by dye testing. The production of his plant, whether his processes are economically successful or not, may depend purely and simply on the accuracy of dye testing.

That, in a rough way, is the scope of this subject—and it is a tremendous one.

Of course, in dye testing we have, from our point of view, to determine strength, shade, solubility, fastness properties, level dyeing. All those points are what we term our dye testing really.

Now, then, suppose the user of dyestuffs gets into trouble with his dye testing; if his dye testing is not accurate he may lose a great deal. First of all, he may not buy the most economical dyestuff unless he knows just what strength he is getting; he may obtain a color which will spoil the shade of his goods, unless he is very careful about his shade; or he may hold up his production by using a dyestuff that hasn't the right solubility, or one of those properties that will enter, in the dyeing machinery; finally, he may select a dyestuff which will get him into a great deal of trouble with the user of his product if his fastness is inaccurate.

The manufacturer, on the other hand, if his dye testing is wrong may get far too little out of the crude material

that goes into his processes, his intermediates, or he may turn his color into material which doesn't sell for the best price; he may spoil his color; or, again, he may sell color which doesn't meet with his customers' approval, and lose his reputation, providing he has one. (Laughter.) He may waste a great deal of money doing valueless research work, because one of the primary objects of chemical research is to determine what yield of dyestuff you get from a given quantity of material, and that can only be done by determining strength.

On what does dye testing rest? We have just stated about what we have to determine, but are we sure that we are as accurate as we can be? How accurate are we? Where are the faults? All these points are ones we should discuss.

With regard to the fastnesses, the Society is considering that quite apart.

Suppose a man who is accustomed to doing quantitative work in other lines goes into a dye testing laboratory. Everything that he sees at first creates a painful impression on him. I don't think that is exaggerating. He sees solutions measured from graduated vessels which the physical chemist would throw out without a moment's hesitation. In fact, probably most of you know that the dye tester's aim is just the reverse to that of the physical chemist as regards the pipette. Then he finds that the skeins are dried without any particular attention being paid to conditions; they are just shoved in a dry box which one moment is being opened and the next is not, so that the conditions of moisture and temperature are variable. He sees skeins being turned and notices that some of the dyestuff is spilled. He is told that the dyestuff is not always entirely transferred to the skein; that is, not exhausted.

Finally he gets to the most painful stage: the actual test is not to watch an indicator, but a man takes a skein and looks at it and says how much color there is on it; and, of course, his eye depends on his digestion and his surroundings; his eye varies from day to day; he judges in atmospheric conditions and light that are bound to be variable; so the whole result is a gloomy impression.

But if that man who comes in like that stays there for some time, if you can manage to make him do it, he becomes more and more impressed with the results that are turned out. After all, you have to measure things in results. He will find that the dye tester checks himself surprisingly well, considering what he has seen; and if he is there long enough I think he will admit that dye testing by the methods that are at present adopted for shade and strength, if they are carried out conscientiously and with the best available accuracy, considering the time limit (because you have got to be quick), are as good as any methods he may have used.

The notion that you can get an instrument of precision that will help the eye, I think, is fallacious. You can't do it, because your eye is the most accurate optical instrument known, and I don't think it will be easy to get something to take the place of the eye. It may be possible to accentuate differences by getting a greater reflection of light so as to make the judgment of the eye easier.

I think we can say that our methods are remarkably accurate. But granted this, we still are justified in asking how accurate they are, and also whether we can improve them or not. The difficulty there is in determining quantitatively, because your ultimate authority is the dye tester's eye. We have done some work on that in our laboratory. Just for the fun of the thing we have done this: We would take a sample of color and reduce it—I suppose everybody that has had anything to do with dye testing has done the same thing—with inert material and send it to the dye tester without telling what they are, and ask him to state how they compared for strength.

Those tests will show that the maximum deviation you will get, provided nothing completely out of the ordinary has happened, in a color which is rather hard to judge—say, a basic brown like Bismarck Brown—will run as high in a single series of dye tests as 20 per cent. That sounds just about in keeping with what I said the physical chemist would expect. But I say that quite advisedly. Note that I am not saying the dye tester's eye cannot see finer differences than these percentages. I am saying all the factors taken together may mislead the dye tester to that extent. On the other hand, if you perform a series of dye tests, each a step in the process of standardizing, then you may find a very much higher accuracy—and I say that from personal observation.

I can't think of any other way, although it is in a sense talking shop, to emphasize my point than to state what we consider a careful series of tests to give limits of that kind. In the case of a color that exhausts well—an acid color, let us say—I think we can certainly claim 3 per cent accuracy by the time we are finished. In the case of a black or a color that doesn't exhaust particularly well, I think we can claim 5 per cent—and that is pretty good, close work.

How do we get close accuracy of that kind? Let us take the operations as they come to us. The plant makes all kinds of colors of all strengths and shades. First of all, a sample of each crude charge of color as it is made in the plant is dyed against our standard, the strength of the crude being guessed at by a spot test of the solution on paper before the set of dyeings is put on, so that the strength of the standard and of the crude may coincide. The set of dyeings which are put on will vary, say, by steps of 5 per cent. When complete, these are examined, and if any one of the skeins appears out of line—that is,

if a skein which should show 5 per cent greater strength than another shows equality—the whole set is thrown out and another put on.

When enough crude material is available for a mix, we go back to our records of the crude and use charges which we think will give us the right shade and will insure our having strength enough to allow of standardizing. This first mix is again sampled carefully and tested against standard. The results we get are checked against our preliminary reports on the charges, and if there seems to be a serious discrepancy we repeat the tests.

Standardizing agent is then put into the mixer and the material remixed. Samples are taken and these are once more checked, this time against the standard and against the previous mix. All the dyeings must agree with what we expect before we will pass our judgment on the set. If necessary, more standardizing material is added; sometimes this will be salt or Glauber salt, sometimes it will be crude color which is likely to bring the mix to the right shade. This mix is sampled and tested once more against what went before and the standard, and if now it is found to be standard the mix is dumped into barrels and at least three samples are taken from different barrels. These barrel samples are checked among themselves and with the previous dyeings of the mix, also with the standard. Only when all these agree do we feel that we can send the color to the shipping house. If we clean out the mixer we even check the sweepings separately to see whether what has stuck around the edges of the mixer can have any effect on our mix.

Such a series of tests gives an extraordinary accuracy. The best confirmation I have of this is the fact that the men in the plant will come to us and complain that they have not received full value for their crude; that we have kept 3 or 4 per cent from them. In one case one of the plant men objected, saying that we had defrauded him of 1 per cent of color. When we told him that we did not believe we could see so closely, he told us that for over ten months our dye tests gave him exactly the yield which he figured and were so constant that he felt quite justified in asking us for 1 per cent of color. I may add that the dyestuff he was talking about was Auramine, and that isn't by any means an easy one to judge.

At this meeting, it seems to me, we have a wonderful opportunity to discuss as far as time will permit this topic of extreme interest to all of us who use color, and I hope that we will get really good suggestions for improvements in what we are doing in the way of speed and accuracy. (Applause.)

President Olney—Are there any who wish to discuss this subject or ask Dr. Rose questions?

Mr. Busby—I would like to ask Dr. Rose what he means by accuracy within 3 per cent. Does he mean per cent of dyestuff or appearance?

Dr. Rose—I mean per cent of dyestuff.

Mr. Busby—Which, the standard?

Dr. Rose—Within terms of the standard.

Mr. Busby—Then, your percentage error is a movable factor?

Dr. Rose—I don't understand how you mean that?

Mr. Busby—If you rate your successive lots of dyestuff on a standard of dyestuff percentage, then any successive work later must vary with each successive standard, unless you refer all to one, say, pre-war standard.

Dr. Rose—That is one of the difficulties of the business, and that is why we take a very large quantity of what we establish as a standard, so we will have it for a number of years.

Mr. Busby—So your standard is a production standard?

Dr. Rose—Yes.

President Olney—Are there any further questions?

Mr. Persons—Does that standard remain the same continually, or does it change as time goes on?

Dr. Rose—I will answer that question by saying that two things will alter a standard: one is the demand we get for the dyestuff from the user; for instance, we will say that there is a tendency to ask for a redder shade rather than a yellower one, and we will consciously let that standard drift to the redder shade. The other thing is where the plant can't produce colors that stick exactly to standard, and we have to shift. If we can shift without causing any trouble—I mean, if the variations are so slight that we think mixtures will hardly be affected—we will call it standard color still; but when we are getting away from it absolutely we will not call it standard.

Mr. Persons—How long can you keep a Sulphur color and a Vat color as standard?

Dr. Rose—With Sulphur dyes we have no trouble. We have found, much to our surprise, that bottles of Sulphur Black that we made three years ago apparently test up the same as when we put them up. They have been sealed and triple sealed, and never opened inbetween, and we can't see much difference. The experts all tell us we ought to, but I can't say that we do.

On the other hand, with the vat colors the drying out is really a serious problem, and there we check ourselves by making our standard on the basis of the solid content. So we make a determination of that every time we open a bottle.

Mr. Busby—You say that you tested your blacks that you put away for three years and they have not changed. What do you refer them to?

Dr. Rose—I can only say that we refer them to the ones that have been opened at that time. I might say, my contention is still more striking than I intimated. We have found that bottles that have been in use, opened

and closed up again, don't alter from the other ones. So we have concluded there is no real alteration.

Mr. Busby—I must say I can't agree with you on that. I do not think that is an absolute standard.

Mr. Durfee—I would like to ask Dr. Rose a question as to the minimum weight of dyes taken for a test, for samples.

Dr. Rose—That is a very serious question. We have more trouble with that than anything else—what to get from the plant when we sample our own stuff. We start with about 5 pounds of color taken from different portions of the mix and then take portions of that again. Of course, the actual amount that comes up for color is only a couple of ounces.

Mr. Durfee—How much do you weigh at the time of your dye tests?

Dr. Rose—About 1 gram.

Mr. Persons—I would like to ask Dr. Rose if he can dye a standard one week and agree with it the next week.

Dr. Rose—Do you mean absolutely?

Mr. Persons—Comparing with the dyeing made the previous week.

Dr. Rose—No, I don't see any advantage in that.

Mr. Persons—Why is that?

Dr. Rose—Because there are so many variables that unless you adopt precautions that are simply prohibitive on account of the time and expense involved, you cannot get two samples to always come out alike. For instance, take dyes like Ponsol Violet or Indanthrene Violet 2R; you are going to have an awful job if you insist that two skeins must look the same, because it is so sensitive to the amount of soaping it has undergone. The amount of moisture and all those points make a tremendous lot of difference. I can't see that you really gain anything by insisting on an absolute dyeing, because the whole cardinal point of dye testing is comparative. For instance, I mentioned that matter of soaping. In a sense you soap them all together, so that your condition is constant; but you can't soap exactly under the same conditions as the day before.

Dr. Killheffer—Mr. Chairman, just a moment ago Mr. Busby disagreed with the statement made by Dr. Rose in regard to the absolute standard, and I would like to know what his idea is in regard to having an absolute standard to tie back to.

Mr. Busby—I would like to answer that by giving an analogy of a dye that is in practical use. A yellow dye may be most useful if it has a hue toward the red or toward the orange, and experience seems to show that the dyestuff manufacturer last year made that dye with a certain fixed yellow; this year it runs more toward the red, and another year it may go back toward the yellow again. It therefore becomes essential that there should be some fixed and non-deviating standard of reference.

I think, whatever may be said about the question of dyestuff comparisons being relative, it is undoubtedly true that somewhere, somehow and by some means there must be a reference standard which cannot and does not change, and in order to do that you must have something which is not dyestuff, because in so far as we have been able to make these tests we find that not only in the dyed cloth but in solutions made from dyes at different times there are certain changes in the color. To what extent that is going to be a practical matter in the dyestuffs themselves I don't know, but in the cloths it is a very practical and vital matter; and the means of which I speak are physical measurement means; that is to say, standards of light, of monochromatic light, which do not change, because it is possible to set up a standard of light which does not change, regardless of the year and the observer.

That also brings in the question of the man's own eye. I thoroughly agree that the only requirement for dyestuffs is the requirement which the eye sets down, but all literature and all experience point to the fact that the eye under a great many conditions sees a great many things and says still more. For instance, we have the very historic case of the man who thought everything was blue simply because he didn't know of any other name for colors. That seems like a very strong statement to make, but in a greater or less degree that same thing runs through our whole judgment of colors; because as a dye tester is trained, his color sense and his color speech develop—his ability to describe what he has seen. One of the great problems of a laboratory is to get a man to observe and then report accurately what he has observed.

Therefore, the only thing we can do, having our physical standards which are constant, which can be specified and made again and again, is to see that the eye, the variable instrument, is aided within the range which the ordinary eye can possess and detect. And upon that I would like to rest my decision.

Mr. Shreve—I would like to ask Mr. Busby how long it would take to make a complete light analysis of the dye if you measure all the properties of it?

Mr. Busby—With the present apparatus that is built, it takes about thirty-five to fifty minutes. With the possibilities that are in the apparatus now building, it ought not to take over fifteen.

Mr. Shreve—When it gets down to fifteen minutes, then it will be a practical apparatus.

Mr. Busby—May I ask Dr. Rose how long it takes to make the series of tests on which he relies for the determination of the strength of the color?

Dr. Rose—In standardizing, one day follows the other with the mixing so that we would have, say, a set of dyeings in the morning and another set of dyeings after the

mix is made. It might come up the next morning; again, it——

Mr. Busby (interposing)—I mean the actual test that you make to standardize one day.

Dr. Rose—That depends; it may be anywhere from an hour to two hours.

Mr. Busby—I would like to ask, in connection with the question of the last gentleman, if it isn't possible that we may be talking at cross-purposes there, and that the thing to do is not to rate the test on one sample of one dye but on the whole range of tests for a given condition of dye production. It seems to me that is the issue.

Mr. Moran—In the case of Sulphur Black that you spoke of, would you compare a dyeing from that original standard made at present with the dyeing made three years ago?

Dr. Rose—No; because we do find that the dyeings become very much redder. Really, it is rather a long matter to try and explain how we came to that conclusion. It refers back to the production in the plant, which had been running along so constant that there was very little reason to assume there was any variation in shade. If anything, the old standard should have come redder, owing to oxidation and standing, but when we tested with the material coming through we couldn't see any difference at all. As we went along we couldn't see any indication that the production was coming any redder. We may be wrong, but there was nothing to lead us to believe that there was a difference.

Mr. Busby—How many people are involved in handling an entire operation of that dyestuff in the laboratory?

Dr. Rose—About six.

Mr. Busby—In the tests of which I speak, there are never more than two.

Mr. Moran—Did I understand you to say that successive dyestuffs from the same standard would show an error of 20 per cent, or a difference?

Dr. Rose—No, Mr. Moran; my statement was that if you put on a set of dyeings and weren't careful to run a good many checks that there were enough chances for error in the ordinary method of dye testing to allow of one in the series being 20 per cent out, in the same dyestuffs.

Mr. Fiebiger—The program says, "Methods of Determining the Strength of Dyestuffs."

Dr. Rose said they are testing with 1-gram quantities. I claim that that is a wrong start. Even though you have batches coming directly from the drier and grinder, or have samples out of the mixing department, I would say, for all practical purposes one-half ounce would be a whole lot nearer. I know of cases where three samples from the same mixture got three different shades, and when we threw the three together the figuring came out correct, which shows that it was simply a case of hurry in the first place; that the merchanical part was not done sufficiently well to get accurate results.

I remember also the old saying that every chain is just as strong as its weakest link. Dr. Rose says there are six individuals connected with each dye test. If any one of them makes a break, the whole six of them are just as bad as the one that makes the mistake. (Laughter.) And there is my whole claim: that dye testing should be individual work, and not group work.

If there is a difference of 2 per cent in the weight of the cotton used between any one of the number of skeins used, or if there is a difference of 2 per cent in the weighing out between any one of the samples, or if there is a difference of 2 per cent in making the solution, by just slipping in a little undissolved dyestuff, it doesn't matter in the final result—it is simply inaccurate. If luck is with you, those errors will counteract each other; and if luck is against you, they will multiply and come out as a 10 per cent difference.

I had occasion a few days ago to dissolve a sample of dyestuff made in this country. There was 1 grain of—well, a small rock, we will say (laughter), in there, which naturally would have passed that sample off as very much weaker. Yet that is nothing unusual. Things like that will happen. Everybody knows that no dyestuff can be manufactured without using salt, or something in that line, here, there or somewhere in the process. It simply cannot be avoided; it belongs to the business. (Laughter.) I mean that absolutely. You cannot get a dyestuff out of its solution by whistling; you have to salt it out. (Laughter.)

The same thing happened in the old country, where they have been making dyestuffs for so many years. I remember, about forty years ago a man was trying to sell us his dyestuffs for printing and we had found sand in the sample—very fine sand. It came from the Marne River, which carries quite a bit of sand. The colorist (that was my first year in the business; I was only a volunteer there) refused even to test it after he had seen that. The representative who was selling the dye—a very well-known gentleman; one of the leading lights in the dyeing industry later—was absolutely disgusted. He said, "Why don't you at least give it a trial?"

The colorist said, "Are you willing to pay for the whole printing machine outfit if we spoil it on one pattern?"

On thinking it over, he decided he was not so anxious to replace the rollers on a ten-color machine.

So in dye testing all those things must be taken into consideration. First of all, I think we should not expect that average sample in the smaller quantity, and then we should not expect by group work to get as good and as

exact results as by individual work, as each man has to check up his results with those of the man before him. Besides, in dye testing, when we want to determine the strength, in the first place we have to start by finding out if our shade is near enough to judge the strength, if there is a variation in shade. Nine out of ten will in one way or another describe that variation in shade as a variation in strength also, and we have to have the correct shade before we can determine the exact strength.

Thank you! (Applause.)

Mr. Livermore—I was very much interested in what Dr. Rose said as to the limit of accuracy of dye testing as we carry it out. I think I can agree almost entirely with everything he has said in that respect. But I was also very much interested in what Mr. Busby has brought up, whereby there is a real practical possibility of an absolute method of testing.

There are some fallacies in what we do now that I don't know of any way to overcome. For instance, during the war one of our manufacturers made a blue, which was the only blue we had that was fast on wool, and it developed that we shut down more or less just after the war—all the other woolen manufacturers did, I think—and the American manufacturer didn't make any during that period, not caring to pile up stock. When we started up again and began to take up that color again, we found that our standards had deteriorated so that they were—I won't say unrecognizable, but they certainly were not standard.

Our standards had changed, and the only thing we had to prove that the change had taken place was our preserved record dyeings. We all know that those are not absolutely accurate either; that is to say, we couldn't probably duplicate those exactly week in and week out. There would be a variation within a certain percentage which the temporary conditions of our dyeing, our wool, our water, our temperatures, and so forth, would bring about.

We were therefore absolutely without any true standard for that particular color, and to the best of my knowledge we haven't got one yet. Fortunately, the color has rather gone out of use. But the point that I wish to speak to is just this: Has Mr. Busby in mind a practical way by which we can make record dyeings which will be absolutely permanent, and to which we can refer later examinations of our dyeings with confidence that we shall know whether we are getting just the same thing that we had before or not? If so, I don't think the question of whether it takes a half hour or ten hours is material. (Applause.)

Mr. Busby—We spoke at first of the question of an imperishable standard, and then spoke of it in terms of optics. Just a little investigation of the apparatus and the methods involved and a study of the tolerances and the precision of these equipments will convince you that not only is the repetition of the performance of the instrument within the visual power of detection, but it is also within the limits of physical measurement of detection, which, I think, is stretching the point pretty far.

I have a word to say in defense of the dyestuff manufacturer. Dr. Rose has spoken of the requirement that a color be of a certain shade, and I afterward mentioned that some of those had departed from their shade, more particularly from their hue.

Let me for a minute stop to state the definition of a color as we describe it is either light or dark, either clear or dull, and varying in its appearance as one color to another, like its hue—blue, red, green, and so forth. We carry it still further and on colored material we specify texture and the reflecting power of that material, or sheen. I think you will agree with me that that covers the case.

All of these factors can be measured accurately in proper precise physical measurement or terms and a record of a dyeing such as Mr. Livermore suggests can be made either after the dyeing is made, or of the dyestuff solution which was used to dye it, so that the record will be a photograph of a curve which, I think, you will all agree is fairly imperishable, or a photograph of the spectrogram of that dyestuff, or a photograph of the plot which expresses all those qualities of which I speak. In that sense, if you are looking for an absolute, undying record you have it. From a practical point of view, the dyestuff manufacturer doesn't have to be that close always. I think that we can credit the dyestuff manufacturer with trying to honestly get his standards the best he can. Of course he does; there is money in it for him. He has to compete, the same as we do, and we are all competing on a basis of quality. If he wants that kind of an ultimate standard he can get it, but if he doesn't need it he has plenty of check measurement instruments which can be used for approximate factors that are well within the range of the eye to detect.

President Olney—The time allotted to this subject is pretty nearly up. I would like to allow Dr. Rose two or three minutes to close the discussion, however.

Dr. Rose—I should like to ask Dr. Busby, with regard to this optical record—I have seen curves of that sort and I quite appreciate they are imperishable records of the curve representing the actual reflected light in the different hues of the spectrum and that we can make records of that kind; but I should like to ask him, as far as this optical method of measuring is concerned, how much the apparatus would cost us as contrasted with the work of a boy turning skeins? Would the outlay be very considerable? That is one thing we have always been afraid of.

Mr. Busby—Your fear is justified. We at our labora-

tory have spent a great deal of money on the subject of standardization, but it hasn't been altogether for this problem but for a great many problems, and probably some information about our equipment and the expense incurred has leaked through. You ought to have your fears disabused. The actual apparatus which will do that sort of thing is very, very much less than the ordinary color laboratory equipment would seem to indicate. It is impossible to tell in actual dollars what it would cost to duplicate the essential instruments to specify a color, but it looks as though in the very immediate future that cost will be very small indeed, and it will be less than the cost even of a semi-skilled man for one year.

Dr. Rose—That sounds very encouraging.

There is another question that came up about which I wish to say a word. Mr. Fiebiger mentioned the quantity of dyestuff, and the uniformity. The first portions of a dyestuff will not be uniform enough to allow of 1 gram meaning very much. But as the mixing goes on, if you will take the trouble to test the mix by such a chemical method as titration with titanium chloride you will find the variation in two samples is so small that it won't affect the dye samples at all. So that that is a fear that is quite justified, but I don't think it is one that throws us off so very much after all.

The number of people employed in dye testing is simply a result of the amount of work that has to come through. You pay your high-priced men to judge skeins, and that is about all they have time to do; they can't turn skeins; they can't weigh skeins or dyestuffs—somebody else has to do those things. We have found the best security is to specialize on all things; to have one lot to do the weighings, another lot to turn the skeins, another lot to judge the skeins, etc. In that way, each group being responsible for the work assigned to it, we get very, very good results, taken all in all.

President Olney—It looks as though this subject is one to continue next year. Apparently it has not been settled by any means this year. (Laughter.) We must pass on to Number 3, however, "Discussion of the New Tariff Law as regards the interpretation of the following paragraph: 'For the purpose of this paragraph, any coal-tar product, provided for in this act, shall be considered similar to or competitive with any imported coal-tar product, which accomplishes results substantially equal to those accomplished by the domestic product, when used in substantially the same manner.'"

In the minds of many there has been some confusion as to just what the interpretation of this clause in the new tariff might be, and so we thought it would be a good plan to get the point of view of three different sides: the textile manufacturer, the importer and also the dyestuff manufacturer. We will hear first from George A. Moran, chemist of the Pacific Mills, in regard to the textile manufacturer's point of view. Mr. Moran! (Applause.)

. . . Mr. Moran presented his prepared discussion of the subject, as follows:

INTERPRETATION OF THE COMPETITIVE CLAUSE IN THE NEW TARIFF BILL AS APPLIED TO DYESTUFFS

By George A. Moran

The attitude of the consumer can perhaps best be expressed by the statement that he wants what he wants when he wants it. When it comes to imported colors, price is apt to be a secondary question. Statistics show that about 90 per cent of the dyestuffs consumed are of domestic manufacture, so that only 10 per cent of our requirements are for imported products. This percentage will vary with different consumers—some require more, and probably some using none at all, according to the character of work handled. Imported dyestuffs are used only where exceptional quality is required and on the better classes of work where the proper type of dyestuff of domestic manufacture is not available. In these cases price is not so much a question as quality, and the consumer is willing to stand the extra cost to secure the quality desired. The consumer, under the present tariff, can obtain, without hindrance from Government restrictions or interference, any dyestuffs of foreign manufacture he may desire, provided he is willing to pay the price. The price factor, therefore, is the only one that affects the consumer in the interpretation of the paragraph in question.

Before the present tariff went into effect we were sometimes seriously handicapped by the license system in our efforts to get certain dyestuffs which we required. This condition no longer prevails. In its place we are called upon to pay a higher rate of duty, which varies in its rate according as to whether the dyestuff is rated as competitive or otherwise.

The question now before us for consideration is the interpretation of the phrase "similar or competitive products." The law defines "similar or competitive products" as those which accomplish results substantially equal to those accomplished by a domestic product when used in substantially the same manner. The dictionary defines equal as meaning of the same degree of excellence. This would seem to be quite definite as far as the definition goes, as if a product is of the same degree of excellence when applied in the same way as a product we have in use it should be a satisfactory substitute. The word "excellence" would seem to cover all qualities which are desirable for a dyestuff to possess, not merely of fastness and appearance on the fiber but in working qualities as regards applying to the fiber. The law does not say that

the products shall be the same chemically, nor does it say that even though they be the same chemically they are similar or competitive, as if it happens to be a poorly made product or made from impure intermediates it might readily fail to be equal, although purporting to be the same product chemically. Equal would imply equal in purity and brilliancy of shade, equal in appearance overhand and underhand and under artificial light, and to a hot iron, spotting, etc., while in its fastness properties to light, washing and other agencies, equal in its action in applying to the fiber under the varying conditions and methods by which it may be desired to make use of it. Solubility is an important factor. In the case of paste colors, the physical condition—that is, the fineness of division of the particles of dyestuffs in the paste—may be the determining factor in its suitability for obtaining some desired results. However, all this is merely theoretical. The Government's decision will be a practical reality.

They presumably will establish machinery for determining the classification of dyestuffs. Their success will depend on having some exceptionally well-posted dyestuff man available for advice, as the determining of the equality in properties of dyestuffs is an extremely difficult matter. For the purposes of this paragraph, dyestuffs may be divided into three classes: those on which there will be a general agreement that they are competitive; those that there will be a general agreement on that they are non-competitive, and those about which there may be a difference of opinion as to the class in which they belong. It is with this third class that we are concerned. The tariff act does not state who shall decide when a product is substantially equal, but presumably the revenue officials must do this as best they can. This is bound to be a difficult matter, as, while the definition is quite simple, dyestuffs are used for such varied purposes and in such varied ways that while a product may be equal to another for many or most purposes, there may be some special application in which the results are different, or there may be differences of opinion as to the exact similarity of shade, fastness or other properties; one person finding them the same, or near enough for his purposes; another person, perhaps having more exact requirements, finding sufficient difference to render that particular dyestuff unsuitable for his use. However, from the point of view of the consumer it is certain if he wants a given dyestuff he can get it; if the decision of the Government is that the color is competitive, whereas he believes that it is not, he can still get it by paying perhaps 25 or 30 per cent more than if it were placed in the lower classification. This increase in cost, if the consumer really wants the dyestuff, will probably not deter him from buying it at increased cost; for, as already noted, these imported colors are used on the better grades of fabrics, which will usually stand the extra cost for superior results. As the object of operating a manufacturing business is to make a profit, those connected with the purchasing of dyestuffs will naturally endeavor to get them at as low a cost as possible. As the object of purchasing imported products is to meet a specific requirement not met by domestic products, if the imported product is higher in price the consumer could not make such purchase unless he considered it essential; and naturally he is likely to disagree with the Government should it decide otherwise, and disputes are therefore likely to arise. However, as above noted, in case of an adverse decision the only difference will be one of cost. The new tariff increases the cost of all imported dyestuffs. The competitive clause increases the cost still more of those so classified; however, that is what the tariff is for —to raise the price of imported products and thereby decrease their sale in this country.

If we really want imported dyestuffs we should be willing to pay the extra price for them. (Applause.)

President Olney—I think we will hear all three points of view before we enter into any discussion of the subject. We will hear now from A. F. Lichtenstein, of the Ciba Company, who will present the subject from the standpoint of the importer. Mr. Lichtenstein! (Applause.)

Mr. Lichtenstein—Mr. Chairman and Gentlemen: It is rather difficult for me to add very much to what Mr. Moran has said. He has discussed the situation and pointed out really point by point the essentials that interest you as consumers and partly us as people who are supplying you with the dyestuffs.

The new tariff has provided a clause without providing the machinery to handle the clause. It has been like our friend Hylan, who built docks in Staten Island and no boats could get to them; and it is the difficulty of building this bridge that exists between the importer, the consumer, and, on the other hand, the American manufacturer, that is coming up now and should be considered from its various sides and angles.

Mr. Moran justly said that anybody who wants to use an imported product can do so, if he wants to pay for it, and it is our privilege to give it to him, provided we can get by with the price.

The personnel needed to create a testing laboratory that can justly test all these products is a large one, and a proposition that takes the best type of man we can get in this country. Those men are available. Whether they want a Government job for possibly two years is a different question.

When we had the licensing system we had at least something definite. We knew what we were at: a consumer could prove his case if he wanted a certain

dyestuff and he usually got it. To-day the importer is on a somewhat different basis. He can bring in a dyestuff and bring it in regularly. He can have regular trade for it, and the moment some American manufacturers—and, by the way, gentlemen, we are also American manufacturers—say that they have this product, the tariff is jumped and a man's obligations, which he has contracted to fill, are filled at a decided loss to him. It is part of the machinery that we lack, part of the foundation of the bridge, and I, for one, should be very glad if this discussion will bring out some suggestions as to how to handle a certain number of these problems.

As you know, the same dyestuff made by two different methods gives, often, different results. Take just the point of solubility, and that brings us back to our machine dyeing: we may have something that is absolutely soluble and fit for machine dyeing, made in a certain way, and the same dyestuff made in a different manner, probably from the same intermediate to start on, will give different results. One man is satisfied with a dyestuff that is fast to light; the next man wants the same dyestuff not only fast to light but fast to perspiration and fast to washing.

I brought with me to-day a few selections of dyeings of colors that would come under this heading and which require interpretation, under the Government's paragraph, as to "what shall be considered similar or competitive with any imported coal-tar product, which accomplishes results substantially equal to those accomplished by the domestic product, when used in substantially the same manner."

The word "used"—does that mean how it is dyed, or the purpose for which it is to be used? That is one of the points which needs explanation. We can have a fast light yellow that is absolutely fast, and we can have a yellow that is the same till it comes to a test of boiling. These samples are big enough to show here, I think: Here is a Fast Light Yellow R (there was really no choice); the fastness to light is the same, the fastness to acid is the same, and yet the boiling tests vary very decidedly.

We can have a different proposition with an ordinary fast, direct blue. Newport, Du Pont, Cincinnati, and a few others are making Solamine Blues to-day. We can give you domestic Solamine Blue, but we can't give you the clear shade of the imported product. You can take the local shade and green it with Sky Blue, and get something similar, but you don't get the fastness to light then.

We come to another example: a Developed Orange. Here they are dyed ordinarily. For an orange, the domestic dyestuff is absolutely satisfactory for most things; it is a little bit redder than the imported. But when you want it, not for an orange, but for a yellow, you can see which is preferable; here is the imported product and there is the domestic product. (There was a decided difference.)

I have here also some other dyes, Chrome Brown and such things, which this light does not permit of judgment, but it shows the difficulties which will be presented to the staff, or machinery, let us say, of the Government which is to control this tariff matter. Above all, I think a just administration requires cooperation from all of us, and the acknowledging that a certain thing can be used for certain purposes and not for others. All of you can dye a Sulphur Black but when you want a Sulphur Black that is unsurpassed you use the imported Immedial Black. The trouble is that no dyer will tell the Government or anybody else that a certain package he buys will be used for only one purpose, and it will not be used where it will compete with domestic products. Is the man who buys a Developed Orange and also uses it for yellow going to say, "I will buy my yellow from a domestic source and when I want to use it for something else, I will buy it from an imported source?" And is it right to penalize him by making him pay a duty which may double his price for the article? That is one of the questions.

Our industry, gentlemen, needs protection. I think I can go on record as being one of those men who from the early nineties, when I was a chemist at the Arnold Print Works, was always asking for protection of the American dyestuff industry, and I am just as much convinced of the necessity for it to-day as I was then. I have also been a user of dyestuffs, and I realize that it is pretty hard, even if you can get what you want and pay for it, to have to pay the prices that some of you will have to pay if you want certain results.

I acknowledge, of course, that we are importers and that we are looking, the same as the manufacturer is, for a profit. We don't say that the amount allowed us under the present tariff bill is a very great profit, not when you have to buy turkey at 70 cents a pound (when the price was 50 a week ago). But the only solution I can see for it is working together—American manufacturer, importer and user—and giving the Government whatever assistance we can, and acknowledging once in a while that somebody has something that the other man might want to use or the consumer might want to use, and in that way let him get the slight benefit of his share of the 10 per cent. (Applause.)

President Olney—We will now hear the dyestuff manufacturer's point of view from Dr. E. H. Killheffer, of the Newport Chemical Works. Dr. Killheffer! (Applause.)

Dr. Killheffer—The question of interpretation of this similitude clause is admittedly something that is very difficult, perhaps almost as difficult as measuring by physical means the strength of dyes. (Laughter.)

As everyone knows—and it might be well to review in a very brief way some of the things that have gone before the writing of this similitude clause—the matter of a suitable tariff which would protect American dyestuff manufacturers and at the same time not hurt domestic dyestuff users has been debated back and forth for several years and has been just as difficult of solution as the similitude clause now under discussion. And because of the difficulty of writing a tariff as applied to dyes that would accomplish the purpose it was designed to accomplish, the present similitude clause was undoubtedly inserted in the bill.

The dyestuff manufacturers advocated from the first until the last some form of selective embargo, or the publication of a list which would mention by name those products which should be importable, the idea being that then there would not be unfair rates of duties assessed on a great many products that it was recognized had to be imported. The present tariff law is not the one that the dyestuff manufacturers in this country would like to have seen passed; in other words, it isn't their child at all.

We are greatly concerned with this particular clause, because while we have no wish at all to say to any consumer, "You shall not have this or that product," we realize there is a great possibility for a product to be brought in which, while for many of its uses might not substitute a color that is made here, yet when given the incentive of a lower price it can and undoubtedly will substitute.

The only contention of the American dyestuff manufacturer under this present clause is that he does not want to see the consumer penalized, but he does want to see values equalized on products that are competitive. I can best explain that perhaps by giving this instance—it is the one that Mr. Lichtenstein cited, Solamine Blue: Solamine Blue is made in this country, one particular type of Solamine Blue. That particular type, I think it is admitted, is just as good and just as bright and just as fast in every particular as the same type imported. There are, however, other classes of blues, like Benzyl Fast Blue 4GL or Chlorantine Fast Blue 4GL, which for some particular purposes give greener and brighter shades, let us say. Now, the American manufacturer does not contend that the consumer should not have this greener, brighter blue for those particular purposes, but he realizes full well that if there is not an equalization of values, Benzyl Fast Blue 4GL or one of the other brands can, if you please, and probably will substitute almost entirely the use of his Solamine Blue FF. I am free to say if I were a dyer, because of the difference in shade, and if there was also a difference in price I would make it my business to substitute one for the other. That is the situation that the American dyestuff manufacturer would like to avoid. In other words, he doesn't want to dictate to the consumer what he should have, but he would like to see values so equalized that he has a fighting chance to stay in business; he doesn't want to ask for anything unfair.

I think perhaps mistakes have been made on both sides. I say both sides, because, unfortunately, there have been two sides. In that connection Mr. Lichtenstein said there was need for great co-operation. I am 100 per cent for that. I think it is a shame if the American producers line up on one side and the importers on the other, and throw bricks at each other that land on the consumer's head.

Along the line of co-operation here is one very pertinent thing: if manufacturers and importers, who have spent all their lives (their business lives) in the dyestuff business, see great difficulty in the interpretation of this clause, where does the Customs Department come in, who are very limited in the men that they have available, and limited in every way—personnel, facility, and everything that goes to determining the point at issue? While listening to the remark on the subject of co-operation, I was wondering if it might be possible for an Association such as this to be helpful in the way of forming a board or a committee, or whatever you might want to call it, to act in conjunction with the Customs Department. Mind you, I haven't given any thought to this. It just occurred to me as Mr. Lichtenstein was speaking a moment ago; it is simply carrying out the thought expressed a while ago—that the American manufacturer doesn't want to ask for anything unfair, doesn't want to ask for any special advantages under the similitude clause of the tariff, but simply asks for a fighting chance or an equalization of values on products that are competitive.

We should have some competent body somewhere to pass on individual cases because, as I see it, there will be cases where products should be imported, and there will be many others where those products, just as in the case referred to a moment ago—the Benzyl Fast Blues—will undoubtedly, perhaps gradually, perhaps not so gradually, replace the American product because of price.

I don't know that it will serve any good purpose to cite a lot of instances but I have one in mind which is a case that might be a very troublesome one, and which is simply illustrative of the many cases which will arise.

The manufacturers are making a certain class of

goods, let us say ginghams. One manufacturer will put in Indanthrene Blue GCD to make his blue shade for these wash ginghams. Another manufacturer will put in his line of ginghams Ciba Blue 2B, let us say, to make his blue. Now, those two products are not the same. They are not exactly the same in shade; they are not exactly the same in fastness; but in a line of washable ginghams, comparatively the same class of ginghams, one blue can be used, if the desire is there, to replace the other.

The American manufacturer does not contend that the textile man who wants to put Ciba Blue in should not do so, but he does feel the basis of duty on the imported one should be such as to equalize the values, so that there will not be the incentive of price, if you please, to make the consumer replace one for the other. In that connection, it is realized, of course, that there are cases where Ciba Blue can be used more suitably than Indanthrene Blue. I simply cite the instance of ginghams as an example, because I happen to know there are several mills doing exactly that thing. In a case like that, the American dye manufacturer feels that his interest is really parallel with that of the textile man who uses the Blue GCD, because someone else who uses another vat blue at a lower price in a similar line of goods has certainly got the jump on him as to price, although he may not have it in some other particulars.

The whole question, as I said a while ago, is very difficult, gentlemen. I am frank to say the dyestuff manufacturers can't throw very much light on it, at least they haven't any solution to offer toward the interpretation of the clause. They have, as I have tried to express it, certain desires and certain wishes in regard to the interpretation of the clause, just as have the users of the products and the importers of them.

How to definitely solve the problem—I am not sure but what that must be settled by agreement, and in large measure be dependent upon the particular cases that arise; and how sufficient safeguard should be provided I think will have to be settled in very much the same way.

I had prepared some notes, but I thought perhaps it would be better to just try to express briefly the way the manufacturers feel about the clause, feeling that there would undoubtedly be quite a discussion on the thing which would very likely bring out points that could be much better brought out in a discussion of the subject than simply in a statement of the case by me. (Applause.)

President Olney—I think we can take about ten minutes for discussion of this subject. I feel, however, before we go into a discussion of the matter, I should give the other speakers an opportunity to say anything which has come to their minds or that has been suggested through the remarks of the others. I will call upon Mr. Moran first; have you anything further to say?

Mr. Moran—I don't know as I have much further to add, except that Mr. Lichtenstein called attention to Immedial Black as being a color that will give results in certain instances that may not be obtained by an American-made Sulphur Black. The duty on an imported Sulphur Black, if it was rated as being competitive, would be 60 per cent of perhaps 25 cents, or about 15 cents a pound. I doubt very much whether the duty if figured on a non-competitive basis on Immedial Black would be very much less. So that I don't believe it would make a whole lot of difference which way the law was interpreted in that particular instance. Immedial Black purchased in Germany and brought over here, and allowing for the necessary expense, probably wouldn't be an awful lot under the selling price of American sulphur black. (Applause.)

President Olney—Mr. Lichtenstein, would you like to say anything further?

Mr. Lichtenstein—There is only one point I would like to mention, and that is with reference to a point Dr. Killheffer touched on—the costs. It may interest you gentlemen to know that our wage costs in Switzerland are fully as high as, if not higher than, the wage costs in the United States. The basic wage is 16½ Swiss francs—please don't confound it with French francs, Italian lire, Roumanian lei, or anything else. A Swiss franc is almost 19 cents. The man gets so much more for each child, so much more for each year he has been in the works; and, gentlemen, he gets a pension. The result is that our labor cost is, if anything, higher; because we do not get the output, we don't get the amount of work out of a man over there that we do in this country. And it may be desirable to draw a certain line between the Swiss dyestuff industry, which supported the American industry during the war, and the German. That it is difficult to draw this line in a tariff I realize.

There is one other point Dr. Killheffer made, and that was with regard to Ciba Blue 2B replacing Indanthrene Blue GCD. They will replace one another. A sulphur blue will almost do the same job; but they are quite different. If you want to dye a Pullman towel you use GCD. If you want to dye something almost as good but not quite as good, and cheaper, you can use Ciba Blue 2B—a color developed in our plant and which has a large and innreasing use.

There is one other point I would like to mention, and that is the possibility of a committee being appointed to co-operate in this matter. It is only through co-operation that we are going to get anywhere. I think if this body,

of which I am to-day not a member, decides on a move of that kind, your decision, especially if expressed in Washington by Dr. Killheffer, would have a whole lot of effect or would bring a whole lot of good with it, and possibly a fair solution of the problem. (Applause.)

President Olney—Dr. Killheffer, have you anything further to say?

Dr. Killheffer—No.

President Olney—The subject, then, is open for discussion among the members.

Dr. Scott—Mr. President, there is just one phase of this, from the consumer's point of view, which has come to my mind.

As a former speaker has said, I don't think anybody knows just how the Custom House is preparing to settle this thing, but judged on the basis of the way that the embargo provision was handled there is one feature that comes to my mind that was a little bit unfair to the consumer, possibly. It was provided—I think Mr. Lichtenstein touched on this point—that if some American manufacturer sent a statement, as I understand it, to Washington saying that he was manufacturing a product similar to one that was being imported, immediately after that when a consumer applied for a license to import that product he was turned down; he might have been importing it right along, but in his next application he was turned down and then given an opportunity to prove his case as to whether the product was different from the article manufactured here.

That, from our point of view, was somewhat unfair. It seemed to us that before an application for the importation of colors should be turned down (which colors we might have been importing right along) it should be necessary for the manufacturer who claimed to manufacture a substitute to definitely prove his point to some authority.

That same thing arises in connection with this matter of charging duty. I don't know how it will be worked, but if it is worked so that a manufacturer can by a statement to the effect that he is manufacturing a competitive product automatically put that in the competitive class and get an increase in duty on the imported product, then the thing comes back to the consumer again to prove his point. He may be able to prove it, but there may be quite a delay in doing so. As everybody knows who has ever had anything to do with such things, there is a whole lot of red tape connected with it, and very often it holds up the obtaining of that imported color, which might be of votal necessity to the plant at the time.

That is another reason why I hope there will be cooperation between the customs authorities and somebody that is capable of passing intelligently on the question of whether the American product is competitive or not, or perhaps requiring the American manufacturer to furnish reasonable evidence that his product is competitive. I don't think that is unfair to the manufacturer, and I am sure that it is considerably fairer to the consumer.

Mr. Fisher—Mr. President, I believe this body represents chemists from manufacturers, consumers and importers, and if we have any selfish interest at all it is to promote the opportunity of chemists in America. I think the real dragon we have got to slay is the German dyestuff trust, and most of us thoroughly understand just who the fellows are that are working to knock out the American dyestuff industry.

I think Mr. Moran said something which is very true when he said that the object of buying foreign colors is the necessity of producing results not obtainable with domestic products, and if we meet that requirement honestly we will have very little trouble.

I would like to make a motion, Mr. President, that the Council of the Association offer their services to the Government in an advisory capacity. All the Council members in this body are pretty well familiar with who the members are, and if any real problem comes up they can easily pick out one or two experts to help them. (Applause.)

President Olney—You have heard this motion made by Mr. Fisher; is it seconded?

. . . The motion was seconded by Mr. Lehmann.

President Olney—The motion is now open for discussion.

Dr. Pratt—I should like to inquire as to how the Council is divided; how many are consumers, manufacturers and so forth.

President Olney—I don't know exactly what class I come under myself. You can decide that. (Laughter.)

Dr. Pratt—I asked that question, Mr. President, because I think the body ought to consider it before passing the motion.

President Olney—I will go through the names of the Council members, eliminating myself for the moment:

William D. Livermore, Vice-President, is the Chief Chemist for the American Woolen Company.

William H. Cady, another Vice-President, is a chemist for the Pacific Mills.

Walter E. Hadley, our Secretary, is the Chief Chemist for the Clark Thread Company.

Winthrop C. Durfee, our Treasurer, is a past chemical dealer, but chiefly an investigator. I think that——

Mr. Durfee (interposing)—For the last three years we have been doing all the reference work for the Textile Alliance, Inc.

President Olney—Then, there are:

Elmer C. Bertolet, Professor of Chemistry at the Philadelphia Textile School;

Arthur E. Hirst, Assistant Superintendent and Chemist for the American Printing Company;

George A. Moran, Chief Chemist for the Pacific Mills;

William K. Robbins, Chief Chemist for the Amoskeag Manufacturing Company, and

Walter M. Scott, Chief Chemist for the Cheney Bros. Silk Company.

Mr. Moran—You didn't mention Mr. Moorhouse.

President Olney—Mr. Moorhouse was elected this afternon; he is the manager of the Boston office of the National Aniline & Chemical Company.

The Chairmen of the Local Sections also are members of the Council. Mr. Christison, Chairman of the Northern New England Section, is the Chief Chemist for the Arlington Mills.

Mr. Culver, Chairman of the Rhode Island Section, is the Manager of the Ciba Company office in Providence.

Dr. Rose, Chairman of the Philadelphia Section, is the Chief Application Chemist for the Du Pont Company.

Mr. Wood, Chairman of the New York Section, is the Manager of the Oriental Silk Printing Company.

That is the status of the Council. Understand, of course, that on the Council the textile end has been emphasized. That is the principal object of this Association—the original object—to have an association of textile chemists, and those who apply dyes, bleach, finish, etc.

Dr. Killheffer—Mr. President, before this motion is put to a vote it would be well for us to realize the amount of work that will be necessary for those who undertake this job. (Laughter.) I don't believe, personally, that this Council would ever be willing to undertake such a job at all. It means devoting a great deal of time to the matter. I believe this Association is better qualified than auy other that I know of along the line of ability to handle the job, but I hardly presume to suggest the best way to do it. I don't believe the Council as it is constituted, with the large number on there, would ever function on this matter, certainly far from 100 per cent.

As far as the customs authorities are concerned, the impression that I have had all along was that they were more than willing for aid of that kind to come from recognized authorities in the business, whether importers, manufacturers or consumers. They want the facts.

While I am on my feet, I would like to ask Mr. Lichtenstein what he thinks of this—it is a color that I referred to a moment ago: Solamine Blue FF or Benzyl Fast Blue 2GL or 4GL, or any of the series. There might be cases, and undoubtedly will be cases, where the imported blue will do some things that the domestic product will not do. In those cases, the imported product should not be held on the competitive basis, we will say. The product could, however, be used to substitute the domestic, as I said a while ago. Upon what basis, then, should the duty be assessed on that product.

Mr. Lichtenstein—Those two dyestuffs are dissimilar—that is a point that should be made. We can all get a red shade of blue, when we start with green. You can always redden it; you can always darken your mix. It is very hard to refine it, and to my mind it is almost impossible to prevent a mill from buying it for one purpose and using it for another.

If you are going to attempt to run every mill in the country and every mill chemist, you are assuming a still bigger job than you have handled of late.

It is very hard to say, but I should think in a case of this kind there should be no restriction on the importation of a dyestuff such as that. Your argument can be carried a little further. Our competitive product is the 2GL. The beautiful 4BL made by Eberfeld is a color which you cannot replace with anything else. We know it; but you can, again, get the 2GL shades with it. I, for one, would be perfectly willing to let any man buy whatever he wanted and replace my 2GL.

We can make a Solamine Blue in this country as well as you can, but we are not making it. It isn't really a competitive color, in my estimation.

As far as price is concerned, our price is higher, and has always been higher, than that at which the domestic blues are selling. It is a better product and deserves a higher price. When you can turn those tables, I will be glad to take the other side and say it shouldn't come in from the other side.

Dr. Killheffer—Leaving that specific color out of the question, we will assume a color, then, without name: it has special uses that can't be duplicated. Yet, on the other hand, it can substitute for the domestic one in other uses. For one set of uses there ought to be a duty assessed, and no duty for the other set of uses. That is one of the problems, I think, to be worked out.

Mr. Lichtenstein—That is what the law calls for, but it is going to be hard to handle.

President Olney—We have a motion before the house; is there any further discussion?

Mr. Moran—I don't see how the Council could undertake such a task. I agree with Dr. Killheffer that the problem would be a monumental one if it was turned over to the Council. Most of the members of that Council are fairly busy men and it would take the entire time of several pretty well-posted dyestuff men to decide all the questions that might arise under this clause.

Further than that, the task of determining this is placed presumably upon the Government officials. They have sent around a circular letter to various people asking them to recommend men who are suitably equipped to be employed to determine these points; that is, experienced

dyestuff chemists. They have also sent out circular letters requesting standard samples of dyestuffs which they could use in arriving at their decisions.

The Council of this Society might readily act in an advisory capacity in a general way, but it couldn't undertake the specific deciding of what was and what was not competitive.

Mr. Durfee—Mr. Chairman, I think it would be very ill-advised to offer the services either of the Association or the Council to the Government, but I think it would be perfectly proper to pass a resolution that it is the sense of this Association that there should be a committee of scientific men to work in harmony with the Government in the administration of this law.

Mr. Livermore—As a member of the Council, I am obliged to say that I don't think the services of the Council could be offered to the Government in any such definite way as is proposed. I have no doubt that any one of us would be very glad to render any assistance to any Government official that we might be able to on subjects which did not affect the firms by whom we are employed. But to make a general attempt as the Council of this Society to define such things as should be brought in as competitive and such things as should be brought in as non-competitive dyes seems to me to be altogether out of our province. We can't get together easily enough, and the problem is far too large. (Applause.)

President Olney—Is there any further discussion? We have this motion to consider.

Dr. Scott—Mr. President, I think the motion itself hinges on what this offer is to be; that is, if it is to be an offer simply of co-operation in the matter of advice, or something of that sort, I think it is well within the province of the Council. If it is to be a matter of making actual decisions, I agree with Mr. Livermore and the other members that we have no authority and have no time to go into the data which would precede those decisions. But it is possible that we might be able, if certain problems came up, to suggest a means for the solution of them to the authorities.

Mr. Fisher—Will you please have the motion reread as I made it?

President Olney—As the presiding officer of this meeting, I recognizze it is out of place for me to speak on a motion before the house, but I would simply like to make this suggestion: It appears to me it would be far better if the Government should request our services rather than for us to offer them. That is the way I feel about it.

Dr. Hollander—Mr. Chairman, in reply to that, I would like to say the American Institute of Chemical Engineers has come forward with very definite offers of help of several kinds, and they have been accepted by the authorities, if I am not mistaken.

President Olney—We apparently have diametrically opposite points of view.

If there is no further question we will put this motion.

Mr. Fisher—If it is your desire that I do so, I am perfectly willing to withdraw my motion, although I was in hopes that it would go through. It seems to me we could very properly volunteer our services to the Government in case of a disputed point arising, and if you think it advisable I would like to reword my motion in that way.

Will you please have my original motion reread?

Secretary Hadley—"That the Council of the Association offer their services to the Government in an advisory capacity."

President Olney—Then, you withdraw your first motion and substitute this one in its place?

Mr. Fisher—Yes.

President Olney—In which case it will have to be seconded again.

. . . The motion was seconded.

President Olney—The motion, then, as I understand it, substituted by Mr. Fisher for his original motion is that we volunteer our services to the Government in case of a disputed point arising. All those in favor say "aye," opposed "no."

. . . The motion was lost.

Mr. Busby—Mr. Chairman, if I may be so bold, I would like to say that the Government, which is ourselves and all the other people who are concerned in the business of the democracy, is not going to take lightly any presumption on the part of even a technical society. Therefore, isn't it fair to assume that the most we can do is to submit that this is an organization of men who are engaged in the interpretation of intricate problems of the application and uses of dyes, and offer ourselves and personnel, for them to accept or not, as they may see fit? In other words, we should take the attitude that many of the technical societies did during the war: they offered themselves as a—shall we say?—personnel list, to which questions might be referred and personnel drawn, if necessary, but beyond that made no further statement.

I therefore move, Mr. Chairman, that the President of this Society be authorized to state that it is the sense of the members of this Society that they are aware of the many and intricate problems that are before the Custom House, and that the membership of the Society and the officers stand ready at any time to offer whatever assistance it may be possible for them to render.

. . . The motion was duly seconded by Mr. Hanna.

President Olney—You have heard the motion; if there is no discussion I will put it to a vote. Those in favor say "aye," contrary-minded "no." The motion is lost.

. . . A standing vote was called for; the question was put again, and lost.

President Olney—We still have one more subject to consider; but before going on to that, Dr. Killheffer wishes to make an announcement about the dinner this evening.

. . . Dr. Killheffer made an announcement with regard to the banquet.

Mr. Fiebiger—Mr. President, before passing on to the next subject may I say one word in regard to the tariff?

Mr. Chairman and Gentlemen: I have had the misfortune, if I may put it that way, of being assigned to the task of making this clause of the new tariff law work. The question of differentiating between competitive and non-competitive products seems to be very difficult; yet there is another clause in the law which says, whenever in doubt the higher duty applies—so that will let us out fairly easy. (Laughter and applause.)

There is another question which, to my mind, is even more difficult than that of competitive or non-competitive products, and that is that the laws says the Secretary of the Treasury, through his organization, shall establish types of the lowest commercial strength in use in 1914, and the Appraiser has sent out circular letters to the consumers asking for such samples of the lowest strength commercial types of dyestuffs. So far, I must confess, the result has been very meager; in fact, it is microscopically small. (Laughter.) We will hardly be able to establish types which can be sent out to all the interested parties and say, "This is the type; in the future you will have to be judged by that." Yet it says that the duty assessed shall be 7 cents a pound or a multiple, which may be three, four, five or six times as much.

Another trouble is this: some importers take the point of view that the type they imported was the commercial type. Where is the decision going to come from if the consumer does not furnish the Treasury Department with the lowest strength types in commercial use? I may have an opinion on it, and so may you; but opinions are not proof of fact. We must have something more substantial than that, and I hope that every one of you will do what you can to help the Department to establish those types in the competitive class. As I say, wherever there is a doubt the law provides the higher duty must be assessed.

Mr. Persons—What is the minimum quantity that will be of any service?

Mr. Fiebiger—I think it is impolite to say that I think we ought to have about a pound (laughter), because if you were to ask anybody for a pound sample of a standard from 1914 he would think you were actually reckless. (Laughter.)

President Olney—We will pass on to the fourth heading on our program for this afternoon, "Discussion of the Fastness Tests as Proposed by the Research Committee." This will be led by the Chairmen of the various subcommittees. The first committee to report was that one under Mr. Livermore, in regard to tests of fastness of dyes on wool, to washing, scouring and fulling, and we would like to hear from Mr. Livermore first.

Mr. Livermore—I don't feel there is anything that I can add, in the way of discussion, on that report as to fastness, except to say that we produced the thing that was published. We are listening for criticism, and we will be very glad to meet those criticisms as best we can and make alterations in the report to cover such criticisms, if possible. I would be very glad if anyone will call attention to any weaknesses in the report on fastness of dyed wool to fulling, scouring and washing; I will attempt to answer it, or if I can't do that I will take it up and change it.

President Olney—Are there any questions with regard to this report?

Mr. Christison—Mr. President, I had just one question about that report. It is some time since I read it, but as I read it my criticism of it was that there was too much manual testing. That is—I wish I could remember exactly; but in making fulling tests and scouring tests, a good deal depends on hand work; and in the laboratory, where we have a good many colors to test, and perhaps a good many samples of our own production to test, we must have more mechanical means of testing. In the way of scouring, it is almost impossible to have a laboratory assistant stand over a beaker or a basin and scour a thing for some time.

I would like very much if there had been mechanical methods devised for that. For instance, I think it would have been better if the scouring tests could have been done in such a standard thing as a fruit jar and rotated for so many minutes or hours, and things of that kind, so that we might make a good many tests at the same time and eliminate the manual part; because one boy may put far more energy into the scouring of a sample than another, and things like that. I think we ought to make it as mechanical as we can; and if we did make it mechanical it would be far more definite and it would be far easier for different laboratories to duplicate.

Mr. Livermore—I think Mr. Christison has made a very good point. Of course, we tried to make our tests correspond to some definite standards in use. We found that a certain amount of hand fulling or scouring corresponded pretty well to two hours' actual fulling in the mill, and therefore we used the two as interchangeable.

If it is possible to evolve a mechanical contrivance for the laboratory that will produce the effects of two or four hours' fulling in a Fulling Mill, and such a contrivance can be standardized better than the hand work of an assistant in the laboratory, I shall be very glad to publish or

add to our method a description of such an apparatus. I don't think I know of any at the present time.

Mr. Christison—Regarding that fulling, that is about as tedious a thing as we have to do, and perhaps Dr. Rose might give us a little information. If I remember correctly, he had in his laboratory a device for testing colors to fulling. As I remember it, it is a very simple thing and something that could be fairly easily duplicated in any laboratory, and something that would eliminate the uncertainty of manual work.

There is also another way in which that could be done that we have found in our own case is quite satisfactory, and that is by having a small drum with about twelve sides and a weight on the inside of the drum, the material fastened to the weight and rotating it. That is quite satisfactory in eliminating hand work and the uncertainty of hand work.

Mr. Livermore—May I ask Dr. Rose to tell me if the method Mr. Christison referred to as being used by him is satisfactory?

Dr. Rose—Yes; Mr. Christison's memory is very good with regard to that apparatus. It is a heavy board on top with a canvas under it to take the soap, or whatever it is; then underneath that is another canvas-covered flat surface, so that the upper one rests on the braids that are tested for fulling, and those braids are soaped and put in-between. But we haven't any means of heating that board. We have to depend on the warm solution out of which we take the braid. Then, there is a motor which actuates the upper surface back and forth, to roll the braids. That gives us fairly good comparative results. Occasionally it is very severe; the boys like to sit on the upper board sometimes. But as a general thing it works very well.

Mr. Livermore—I don't think there will be any difficulty at all in correlating Dr. Rose's apparatus with the methods that we have described, which are older and more common in literature of the past. If it is your desire that that be done, we could very easily make an amendment to our description of the method, stating that such apparatus used for such length of time will produce results which would distinguish the classes.

Does that cover the point to your satisfaction?

Mr. Christison—I feel we ought to be careful in making these recommendations, because it is difficult to change them. I think the recommendations of this Association are going a long way; they may even be taken by our National Government in making tests, or by the Custom House, and I think we ought to make them as definite and as complete as we possibly can at the start.

Mr. Livermore—What other way would you suggest to do that other than what I have suggested in regard to Dr. Rose's apparatus?

Mr. Christison—I don't quite understand.

Mr. Livermore—I have stated we would be very glad to correlate an apparatus of the sort Dr. Rose has described as being used by him, and fit it into our system. I don't see that we can do anything else than that, or that we can go any further than that.

Mr. Christison—I think we should do that; but if we could correlate them, perhaps, before the resolution was passed it might be better.

Mr. Livermore—I think that we would have to wait another year for that. There won't be another meeting of the Society for a year. You can easily choose as to whether you wish to postpone final action on any final methods for a year, or whether you will instruct the Committee to amend their method in accordance with the several suggestions that are made here. I should be very glad to adopt the suggestion that we include this method which you have described with those we have already given. We will be either obliged to do that or postpone action for a year. I am quite indifferent as to which you do.

Dr. Scott—It seems to me that while Mr. Christison's point is well taken, that there may be ways of improving on the mechanics of the test, it doesn't really alter the value of the report as it stands, which is primarily based on the selection of standards.

In putting out this report—that is, in offering these various groupings—we simply offer them, it seems to me, in a comparative way; and we have demonstrated by work already on a test that is written out there that these certain standards will be made in that certain way. We have those standards with which to compare any new colors, and it seems to me that the matter of the mechanics of the test is something that can be improved upon as new ideas come along; but it doesn't affect the original selection of the standards, which is the primary object of the report.

President Olney—Is there any further discussion in regard to this particular point, or in regard to the whole subject of washing, scouring and fulling tests on dyed wool? If not, I think it is in order to make a motion that we accept these methods subject to the suggestions which have already been made, or any others that may be made before that vote is taken.

Mr. Sleeper—Certain dyes were mentioned as being representative of dyestuffs of certain classes and requirements. That dyestuff may have been given out to half a dozen different individuals to apply, and they would get, for instance, a shade of black; and after obtaining that shade of black and testing it, it would possess varied degrees of fastness, and the degrees of fastness which it would possess would depend to a certain extent on the method by which it was applied. I think it would be a

good idea, if a certain dyestuff was mentioned as possessing fastness of a certain degree, if the method by which that shade was obtained were stated in the fastness test; therefore, if I wanted to test a certain black and wished to find out whether it belonged to a certain class or not, I would necessarily have to dye up the black set out as a type, and I would like to know the method by which to apply that black so as to put it in that class to get the best results from it.

Mr. Livermore—I would like to know whether the gentleman has in mind any dyestuffs mentioned in that report, in regard to which a method of application is not stated?

Mr. Sleeper—Are the methods stated for all of these dyestuffs?

Mr. Livermore—The general method is stated, I believe, in every case. We are not stating it in absolute detail, because it would open up the subject and make quite a discussion on the question of whether it was advisable or not to do that thing; but in our opinion—rather, I will take this upon myself and say in my opinion—it seemed best to emphasize the fastness of the dyestuff itself rather than to emphasize specific methods of dyeing. Those are very often matters of opinion and minor details, and I didn't think, and do not think, it is desirable to go into that thing. If we say that 2 per cent of Alizarine Black dyed on a chrome mordant is a standard in a certain class, we believe that quite defines that color; we assume that a standard method of dyeing on a chrome mordant is going to be used. If we say another color is standard for a certain class, when dyed by the top chromed method, we assume that the standard method as usually given in textbooks will be used. But I think we did go to the extent of defining the general method to be used for each dyestuff that we gave.

President Olney—Is there any further discussion? Does anyone care to make a motion in regard to it? As Mr. Livermore has said, it is a case of holding the whole subject up a year, or taking some action at this time, even though that action is modified to a certain extent, depending upon future work of the Committee?

Mr. Christison—I think that this body might authorize the Council to adopt those methods when the Council sees fit, and I think those tests should not be adopted until they are as perfect as we can get them. I think, however, we might adopt them through the Council before another year, if the Council saw fit to adopt them before then.

President Olney—How would it be, then, to make a motion to the effect that the Council be authorized to adopt these methods as official whenever, in their minds, they have come up to the proper standard of requirement and of satisfaction to all members concerned, as far as we can consult them?

Mr. Christison—I would like to have that made as a motion.

. . . The motion was regularly seconded by Mr. Moran, and carried.

President Olney—The next Committee was that on fastness of washing, soaping, laundering and fulling of dyed cotton. Mr. Moran is the Chairman of that Committee.

Mr Moran—I don't think there is much to say on that except that the fastness tests for washing and laundering have been drawn up and published and are open to criticism; as far as I know, no criticism has been offered up to the present time, but it is open to criticism. Fastness to fulling has not as yet been taken care of, I believe, on cotton.

President Olney—Are there any suggestions with regard to this part of the work? In this connection, I would like to state that the Research Committee not only would be pleased but they are anxious for any members of the Association to send to them, to the Chairman or the Secretary of the Association, such criticisms as they have in mind, within the next ten days, let us say; then all of those criticisms can be considered at our next meeting. We put these methods out as preliminary or provisional methods. We have requested a number of times, in the Proceedings, that criticisms be made, and we hear now and then of a criticism here and there on the side. But no one seems to be willing to come out officially and make criticisms, except in one or two cases which we have published in the Proceedings.

I wish you would all, even though we pass these in a sort of provisional way now, go over these methods, and wherever you think there is a weak point put it down on paper and send it to someone directly connected with this work, so that we can consider it. Then there can be no excuse later on for anyone to say that they were accepted without the full consideration of everyone in every way.

If there is no objection I would like a motion in regard to fastness to washing and scouring on cotton, similar to the one on wool. Does anyone care to make such a motion?

Mr. Wood—I will so move.

. . . The motion that the Council be authorized to adopt these methods with regard to washing and scouring on cotton whenever in their minds they have come up to the proper standard of requirement and of satisfaction to all members concerned was seconded by Mr. Hirst and carried.

President Olney—Dr. Scott, Chairman of the Commit

tee on Fastness to Washing, Scouring and Fulling on Silk, will report next.

Dr. Scott—I don't know that I have anything further to add. I am in the same position as the other members of the Committee. We put forward these preliminary suggestions, you might say, or preliminary standards, and we will be glad to hear any discussion that comes up.

President Olney—Is there any discussion on the methods for silk?

Mr. Schaumann—Mr. Chairman, Dr. Scott had Malachite Green coupled with Formyl Violet S4B. In my experience Malachite Green comes down more in shade than does Formyl Violet S4B.

Dr. Scott—In the first place, there is a slight mistake there. We didn't have Malachite Green; we had Brilliant Green Crystals, which when dyed on silk are faster to washing than Malachite Green—and the Schultz number was given. Of course, there is considerable difference in the fastness of Brilliant Green and Malachite Green; and on the basis of our tests Brilliant Green seemed to line itself up more with its correlated product, Victoria Blue B, both of which are basic colors, than did the Formyl Violet S4B, which, of course, was an acid color. We listed the Formyl Violet S4B in a class with Patent Blue A, which we considered similar to it.

Mr. Schaumann—Malachite Green and Brilliant Green are quite similar in that respect.

Dr. Scott—We have found from the experiments we have conducted up at our works—which, of course, have extended over a long period of years—that Malachite Green on silk is not in a class in fastness with Brilliant Green. For that reason, when we want more fastness to washing we always use Brilliant Green in preference to Malachite Green.

Mr. Schaumann—Would you consider the Brilliant Green just as fast as the Formyl Violet S4B?

Dr. Scott—I consider it really faster than Formyl Violet S4B.

Mr. Schaumann—Don't you think it comes down a shade more when you soap it?

Dr. Scott—In our classification we list Formyl Violet S4B in Class 4, and the designation for that class is "colors fast to Test No. 4 without change in shade." Test 4 is 1 per cent soap solution at 85 deg. Fahr. That is the group in which we list Formyl Violet S4B.

Brilliant Green we have listed in Class 3, colors fast to Test No. 3 without change in shade. Test 3 is soap solution at 120 deg. Fahr.

As a matter of fact, in the series of tests which we made we find at 85 deg. Fahr., at the lower temperature, there is practically no difference discernible between the colors Formyl Violet S4B and the Brillian Green, but when we increase the temperature we do find that the Formyl Violet gradually begins to go off more than the Brilliant Green. So when we get to our Test 2—which, of course, neither of these are included in, but it is a comparative rating of the two at 160 deg. Fahr.—Brilliant Green again suffers only a slight loss in shade, whereas we find Formyl Violet losing quite considerably.

There was another reason why we separated the two. It was based on the correlating tests which were made on fulling, under Mr. Livermore's direction, of the same dyed samples that we compared. We find that Brilliant Green in its behavior toward fulling is much more nearly in a class with Victoria Blue B, its corresponding basic color, than it is with the Formyl Violet S4B. There is a question of opinion there. It is quite true, in my mind, that Victoria Blue B is slightly better to scouring—and to fulling, you might say, too—than Brilliant Green, with which it is associated. However, it seems to me that both of them fell within the limits of the class in which they were put, better than if one of them fell within the limits of the class lower. That was the reason for the assigning of those standards.

President Olney—Is there any further discussion of this matter on silk? If not, I believe we are in position to take the same action in regard to that as we have in the case of wool and cotton, if someone will make a motion to that effect.

Mr. Robbins—I make such a motion

President Olney—The motion is made by Mr. Robbins, and seconded by Mr. Wingate, that we take the same action in regard to the provisional method of testing fastness of silk as we have with wool and cotton. All those in favor say "aye," opposed "no."

. . . The motion was carried.

Mr. Christison—Before we adjourn, I would like to take just a minute to reply to the implied criticism as to why the Government officials have not been supplied with 4-ounce samples of dyestuffs in order to check up the imports. The reason is this: For instance, my concern has on file several thousand samples of dyestuffs, 2-ounce samples, and if we followed out their letter, why, it would entail an enormous amount of work, and we should then send them a lot of trash that would be of no earthly use. If they would send a specific list of the dyestuffs they want we would be willing to supply samples weighing a few grams.

The American dyestuff manufacturers and others have been supplied from our laboratory with several gram samples, and they were very glad to get them; those several gram samples have been of great use to them. Instead of supplying the Government with a lot of samples that are of no use to them, and in an unreasonable

amount, I think we all could supply the Government with a few grams of samples they really have to have; and if they would only ask us for something reasonable we would be glad, I am sure, to comply with their request.

Mr. Livermore—The Government has asked for samples and has specified with great particularity how authentic those samples must be. We have a collection of several thousand samples given to us as standards before the war. They are none of them, I think, over 2 ounces. We couldn't possibly give the quantity that is wanted, but we have perfectly good deliveries of German dyestuffs of those types, of which the Government could have the quantity it wants; but the only way that it could be assured that they were standards would be for those deliveries to be tested against our own pre-war standards, which we would be entirely willing to do; but we can't guarantee the delivery that we will give to the Government. We can't give a certificate that that delivery was absolutely standard before the war. We could furnish the dyestuff and we could furnish a statement, or dyeings, to show that those samples of dyestuffs were identical with standards furnished us by the German manufacturers before the war, but that is absolutely as far as we could go.

President Olney—Are there any further remarks?

Mr. Fisher—Mr. President, haven't you a lot of samples up at the Lowell Textile School that you can place at the disposal of the Government? (Laughter.)

President Olney—We have a good collection of samples, but I think the same thing applies with us, in many cases: we have only small quantities of certain dyes, and in specific instances we would be very glad to furnish the Government with samples. Several of the speakers this afternoon have brought out the point that some dyes change entirely in three years. I have wondered what effect that would have on some of these samples for standards back in 1914. I think oftentimes a sample of dyestuff is exposed to the light in the bottle, and I think you have probably all noticed that perhaps for a sixteenth to an eighth of an inch in a glass bottle of dye that stands around for eight or ten years you have a decided modification of the dye. When that is mixed in with the central portion, which probably is unaffected, the standard is going to be quite different from what it was back in 1914. That is one of the reasons why we have hesitated about sending samples, because we were not absolutely certain they were standards of before the war. In many instances also the dyestuff concerns, at our request, furnished us with these most concentrated types of dyes, and we could make no accurate differentiation in many cases between these and weaker commercial standards.

It is nearing time to close our afternoon session. Unless there is something special to bring up, a motion to adjourn is in order.

. . . Upon motion of Mr. Durfee, seconded by Mr. Thompson, the meeting adjourned at 6 o'clock.

[ADJOURNMENT.]

[*Editor's Note—The evening session will be covered in the issue of January 29.*]

ELEVENTH COUNCIL MEETING

The Eleventh Council Meeting of the American Association of Textile Chemists and Colorists was held at the Engineer's Club, Boston, Mass., on Saturday, December 16, 1922. The following members were in attendance: William H. Cady, William D. Livermore, Winthrop C. Durfee, George A. Moran, Dr. R. E. Rose, A. E. Hirst, Dr. W. M. Scott, P. J. Wood, R. F. Culver, A. K. Johnson, William R. Moorhouse, H. Christison, W. E. Hadley.

Prof. Olney was ill with a cold and was unable to attend and the meeting was conducted by Vice-President William H. Cady.

Applications for membership were acted upon, the list of those accepted having been published in the issue of January 1.

The Alembic Society of the Lowell Textile School, being desirous of affiliating themselves with the Association, addressed a communication to the council seeking information as whether they might enter the Association as a Junior Local Section. The Council voted to look with favor upon such an affiliation, following such time as a sufficient number of Junior Members of the Lowell Textile School present such petition signed by the required number of Members.

The matter of offering prizes for the solution of certain Textile Problems was deferred until a later date.

The Howes Publishing Company, New York City, addressed a communication to the Council requesting that they be admitted to Corporate Membership. The Council voted to admit them, and A. P. Howes was designated as their representative.

It was voted to prepare a Corporate Membership blank and the President and Secretary were authorized to proceed with the preparation of same.

The preparation of the Year Book was discussed at some length, and the Howes Publishing Company was authorized to publish same under the direction of the Council, the Association to receive a fixed percentage of the gross revenue.

It was voted that the basis of the allotment of funds for the Local Sections should be the membership of

those Sections during the month of May of any year.

It was the opinion of the Council that Local Sections should draw funds from the parent organization necessary to meet their current expenses, but that the $1.00 per member mentioned in the Constitution represented the maximum amount allowable and that this should not be demanded unless necessary.

It was voted that the Secretaries of Local Sections should render a report of the transactions of these sections before February 1, 1923.

TENTH RESEARCH COMMITTEE MEETING

The Tenth meeting of the Research Committee of the American Association of Textile Chemists and Colorists was held at the Engineer' Club, Boston, Mass., on Saturday, December 16, 1922.

The following members were in attendance: William H. Cady, William D. Livermore, Winthrop C. Durfee, George A. Moran, Dr. R. E. Rose, A. E. Hirst, Dr. W. M. Scott, P. J. Wood, R. F. Culver, A. K. Johnson, William R. Moorhouse, H. Christison, W. E. Hadley.

Prof. Olney was unable to be present, owing to the fact that he had contracted a cold, and was thus confined to his home. The meeting was presided over by Vice-President William H. Cady.

The committee on Fastness of Dyed Material to Light reported excellent progress, and considerable preliminary work was accomplished relative to conducting various tests with the different types of lamps used for fading.

The provisional report on the fastness of Dyed and Printed Material to the Action of Chlorine as presented by Chairman A. E. Hirst is published herewith:

CLASSIFICATION OF COLORS WITH RESPECT TO FASTNESS TO CHLORINE—PROVISIONAL METHOD

The dyed or printed cloth is saturated with bleaching powder solution containing the required amount of available chlorine, squeezed immediately to remove the surplus solution, and allowed to lie for one hour at room temperature (70 to 75 deg. Fahr.) wrapped in cloth or placed in a closed vessel.

Class I—The color shows no loss in strength nor change in shade when treated with bleaching powder solution containing 0.70 per cent available chlorine.

Types: Indanthrene Violet RR Extra Paste (767) 5 per cent print or 6 per cent dyeing.
Ciba Scarlet G Paste (907) 5 per cent print or 6 per cent dyeing.
Prussian Blue Paste (968) 20 per cent print.
Paranitraniline Red, printed or dyed.

Class Ia.—The color shows a distinct change when treated with bleaching powder solution, but the original shade is restored by aftertreatment.

Type: Indanthrene Blue GCD Paste (842) 5 per cent print or 10 per cent dyeing.

Class II.—The color shows no loss in strength nor change in shade with 0.40 per cent available chlorine, but shows a distinct change with 0.70 per cent.

Types: Aniline Black, dyed or printed.
Indanthrene Black B Paste, 15 per cent print or dyeing.

Class III.—The color shows no loss in strength nor change in shade with 0.20 per cent available chlorine, but shows a distinct change with 0.40 per cent.

Types: Alizarine Red SDG Paste (785) 4 per cent print or old method dyeing (alumina mordant).
Logwood Black.
Malachite Green (495) printed ½ oz. per gallon or dyed 1 per cent.

Class IV.—The color shows no loss in strength nor change in shade with 0.10 per cent available chlorine, but shows a distinct change with 0.20 per cent.

Types: Rhodamine B (573) ½ oz. print or 1 per cent dyeing.
Methylene Blue B (659) ½ oz. print or 1 per cent dyeing.
Benzo Fast Red 8BL, 1 per cent dyeing.
Indigo (874) medium shade dyed or printed.

Class V.—The color shows no loss in strength nor change in shade with 0.05 per cent available chlorine, but shows a distinct change with 0.10 per cent.

Types: Alizarine Blue S Powder (804) 2 oz. print.
Chicago Blue 6B (424) 1 per cent dyeing.
Tetrazo Sulphur Blue 6B 4 per cent padding.

Class VI.—The color shows a distinct loss in strength or change in shade with 0.05 per cent available chlorine.

Types: Methylene Green S (660) ½ oz. print or 1 per cent dyeing.
Pontamine Fast Red F 1 per cent dyeing.
Pontamine Green BX 1 per cent dyeing .
Katigen Green 2G 4 per cent padding.

Note.—Figures in parentheses denote Schultz numbers (Farbstoff Tabellen, 1914 edition).

Respectfully submitted,
ARTHUR E. HIRST,
For the Subcommittee on Bleaching.

Foreign Trade Opportunities

Reserved information may be obtained from the U. S Bureau of Foreign and Domestic Commerce and its district and co-operative offices by duly registered firms and individuals upon written request by opportunity number. The Bureau does not furnish credit ratings or assume responsibility as to the standing of foreign inquirers; the usual precautions should be taken in all cases, and where no references are offered it does not necessarily imply that satisfactory references could not be given. Correspondence may be in English unless otherwise stated. Symbols: *Reported by American consular officers; †Reported by commercial attaches and trade commissioners; ‡Direct inquiries received by the Bureau.

3415.†—*Necktie* and *hosiery yarns*—Australia. Firm desires agency and consignment. Quotations, c. i. f. Australian port. Samples requested.

3418*—*Textiles* and *textile machinery*—France. Representation of American firms is desired in the north of France.

4130.*—Sail cloth and *cotton piece goods*—Netherlands. Agency desired. Quotations, c. i. f. Netherlands port.

4096.†—*Hosiery, underwear* and cheap *prints* of various qualities and grades—South Africa. Agency desired. Quotations, f. o. b. New York.

4188.*—Cheap *cotton and artificial-silk hosiery*—Netherlands. Purchase and agency desired. Quotations, f. o. b. New York.

4198.*—*Cotton, wool and silk shirtings,* both pure and mixed—Italy. Purchase desired. Quotations, c. i. f. Palermo. Terms: Cash against documents. Correspondence, Italian or French.

3915.†—*Cotton piece goods* and *silk and cotton hosiery*—Denmark. Sole agencies desired for Scandinavian countries. Agent is at present in the United States.

4087.†—*Cotton piece goods,* especially *prints, cottonades* and *woven blue drills,* and workingmen's clothing, including shirts and trousers—South Africa. Purchase desired.

4088.*—*Sheeting*—England. Purchase desired. Quotations, f. o. b. New York. Terms, payment against documents.

4089.*—*Cotton goods* generally, but principally sheeting (cabots)—Syria. Agency desired. Quotations, f. o. b. New York.

4091.*—*Cotton piece goods, silks,* furnishings, *hosiery, ties* and mercery—Australia. Agency desired. Quotations, f. o. b. San Francisco.

3943.*—*Cotton* and *woolen piece goods* and fents (remnants), and printing and writing paper—India. Purchase desired. Quotations, c. i. f. Madras.

3994.†—Packing-house products in general, codfish, *textiles* and *hosiery,* food products and provisions—Cuba. Agency desired. Quotations, c. i. f. Habana.

3996.†—*Cretonnes, satins, percales, cambrics, shirtings, sheetings, voiles, printed foulards* and *cotton hosiery*—Cuba. American representative of Cuban firm desires agency.

3997.*—*Textiles*—India. Purchase desired. Quotations, c. i. f. Karachi. Payment to be arranged by letter of credit.

4239.*—*Cotton and artificial-silk hosiery* for men, women and children; tools and hardware in general; electrical appliances for lighting, telephone and telegraph services; mechanical toys; enamelware; paints and varnishes; and surgical instruments and hospital supplies—Canary Islands. Agency desired. Quotations, c. i. f. Santa Cruz de Teneriffe. Terms: Cash against documents upon arrival of merchandise.

4233.*—*Fleeced-lined woven skirts and vests* for women, and men's drawers, and fancy hosiery suitable for the English trade—England. Agency desired. Quotations, c. i. f. Liverpool or Manchester.

3428.*—*Woolen, half-woolen and artificial-silk hosiery,* and *knitted underwear* for men, women and children; *woolen capes, shawls, colored zephyrs, satins, striped linings,* and *cotton and woolen fabrics* for men, women and children—Netherlands. Agencies desired from manufacturers.

3469.*—Dry goods, *cotton, silk and woolen piece goods, hosiery,* gloves and knit wear, haberdashery, etc.—Tasmania. Agencies and purchase desired. Quotations, c. i. f. Hobart. Terms, cash against documents.

3482.‡—*Cotton and silk piece goods,* galvanized wire and products, enamel and hollow ware, flour, and groceries in general—Panama. Exclusive agency on commission for the sale of goods in Colombia and Panama.

DYEING ANIMAL AND MIXED FIBERS

Animal fibers are usually dyed in an acid bath but in some cases difficulty is experienced in securing penetration, owing to the tendency of the dyestuff to precipitate.

To overcome this, the A. G. fur Anilin Fabrikation propose in British Patent 171,981 to add sulphite cellulose waste liquor, or its constituent to the dye bath. This diminishes the tendency towards precipitation. If this addition is made, wool, half wool, silk and other animal fibers can be dyed in baths hitherto unsuitable. The treatment in no way deteriorates the fibers, but on the contrary preserves the natural gloss and handle. Moreover, it permits the combined use of dyestuffs of different character; that is, direct cotton and acid dyestuffs.

The following is an example of a bath made up in accordance with the invention:

For 100 pounds woolens—three pounds Alkali Blue 4B, ten pounds sodium sulphate crystals, five pounds sulphite cellulose waste liquor of 280 deg. Be., two pounds sulphuric acid cone. Enter the wool at 80 deg. Cent., raise to the boil and boil for half an hour.—Dyer and Calico Printer.

NOTABLES TO SPEAK AT SILK DINNER

The indications are that the fifty-first annual dinner of the Silk Association of America, to be held in the Hotel Astor on Saturday, February 3, will be an occasion of interest to the entire trade. It will immediately precede and introduce the Second International Silk Exposition to be opened to the public February 5.

Two speakers have been selected for the dinner, both of them men of note. S. S. McClure, editor of McClure's Magazine, will deliver an address on "World Conditions of To-day," in harmony with the international spirit of the Exposition. Alexander Woollcott, dramatic editor of the New York Herald, formerly with the Times, will speak on "Behind the Scenes" in the theater.

During a recent visit to Washington, James A. Goldsmith, president of the Silk Association, called on the ambassadors of Great Britain, Italy, France, Japan and China. It is expected that most of these will attend the association's dinner.

BRITISH COMMENT ON GREEN AND SAUNDERS' TWO-COLOR DYEING PROCESS

The announcement at a meeting of the Manchester Section of the Society of Dyers and Colorists, held at the University, Manchester, on November 17, of the discovery by Professor A. G. Green and K. H. Saunders of a dyestuff which makes two-color dyeing possible at a single operation, represented a triumph for the advocates of research. It was pointed out that the whole matter opens up great possibilities in the dyeing of mixed materials, and, once that is accomplished, it will be the starting point for other and newer discoveries. There may be finality to these things, but that point is a very long way off—so far remote that it is almost non-existent. The announcement offers a practical proof that bread cast on the waters in the way of research still has a habit of returning after many days in multiples of its value, to say nothing of the further promises it brings with it. If there are those among the industrial community who do not see the practical value of research, and it is to be feared that some still linger with us, here is hard matter for them to consider. Two-color dyeing in the manner described may not in itself be a very great matter; that is what may be argued by these die-hards. But that is to miss the whole point, which, to reiterate it, is that all these new things lead to greater things, and we have to follow along the roads opened up and pursue them to the end, sparing neither the means nor the energy. We want it all, and more, to set the textile industry on its feet again, and what we do now, both in the way of money and energy, is an investment for the future that should bring us something even more welcome than big dividends.—R. C., in Journal of the Textile Institute

THROW SILK FIRM REORGANIZED

Announcement was made recently that the Dunmore Silk Company, commission throwsters, Scranton and Dunmore, Pa., had undergone a complete reorganization in the management, and new machinery has been installed throughout the plant. The company states also that it will soon have two plants in operation, one in Scranton, Pa., to specialize on crepe twists and artificial crepe twists for the silk and hosiery trades; and the other at Dunmore, Pa., to specialize on organ and trams for the silk and hosiery trades. The Dunmore plant will also handle artificial silks in the trams. The Scranton plant will be under the supervision of J. O. Darnell, formerly with D. G. Dery. The Dunmore plant will be supervised by M. C. Schlegel, formerly with the Post & Sheldon Corporation, Allentown. The plants will be managed by M. E. Edwards.

W. Little & Co., 233 Preakness Avenue, Paterson, was recently incorporated to manufacture, buy and sell silk and other textiles. Capital, $125,000. Incorporators: Walter Little, J. William Little and Annie J. Little, all of Paterson.

George Palfrey has taken the position as overseer of dyeing for the Amherst Woolen Mills, Amherst Nova Scotia, Canada. Mr. Palfrey comes from Peterboro, Ont., Canada.

The Ontario Dyeing Company, Ontario and D Streets, Philadelphia, is another Philadelphia dyeing concern whose expanding business demands larger working quarters. This company has filed plans for an addition to their present plant, on which work will start forthwith.

Handy Graphics—II

Where Ratio Paper Excels—Forecasting—Inventories—To Compare Changing Prices

By CHARLES F. GOLDTHWAIT and JOHN E. HOFF

Chemists, the Clearflax Linen Looms, Inc.

Part Two of a Series on Textile Chemical Uses of Ratio Paper and Logarithm Scales

THE business uses of ratio paper are of especial value to those whose interests extend beyond the ordinary routine into executive work. Since chemists are so frequently credited (or debited) with lacking business sense, a little first-hand study of business matters may be well worth while, even if not a part of their assigned duties. This paper is therefore offered as suggestive of ways of broadening out and of becoming more generally useful, rather than as a contribution to textile chemistry.

In charting business facts the most businesslike thing of all is to decide first whether a chart is really needed, i. e., whether it will tell more than the figures alone and whether the less familiar ratio paper will offer any advantages over the ordinary rectilinear rulings. This is most easily decided by the use to which the chart is to be put. A clerk or dyer in charge of the supply of dyes and chemicals may have no need at all for a chart, but if the management notices some ups and downs in the inventory record and requires an explanation, even a few lines hastily drawn in pencil will often show more clearly and forcibly than many minutes of argument that the high or low points have depended upon prices, exceptional demands or other equally good reasons.

Without going too much into detail or into the more complicated types of charts, we will present a few ideas which may prove suggestive for various purposes, employing the semi-log or true ratio paper, with ratio rulings reading up and down and equally spaced lines reading across the sheet.

Growth of a Business

The stock example used to illustrate the working of a ratio chart is money placed at compound interest, a large sum and a small sum. Just to vary the monotony we have assumed a $10,000,000 business and one of its separate branches which does $1,000,000. A healthy growth in this particular line is 8 per cent each year which will correspond to the figures in Table 1.

It is desired to post these on a chart and add from time to time the actual business done for comparison. The directors then can tell easily whether expansion is following schedule and whether the branch is keeping up with the whole. The question is just how to plot the data to the best advantage. *Fig.* 1A shows them done in the ordinary way and if actual business followed the schedule curves it would look as though the $1,000,000 branch was getting left far behind. Actually the lines are true to scale and perfectly correct. The average branch manager, however, would not like this picture of his work. The other plan is ratio paper, *Fig.* 1B. The

TABLE 1

Year	Millions of Dollars	
–	1.000	10.00
1	1.080	10.80
2	1.166	11.86
3	1.260	12.60
4	1.361	13.61
5	1.470	14.70
6	1.587	15.87
7	1.713	17.13
8	1.849	18.49
9	1.981	19.81

lines rise at exactly the same rate, as they should to represent equal rates of increase and a true comparison will be seen at a glance. This is just as correct as the first method, looks much better, and the result can

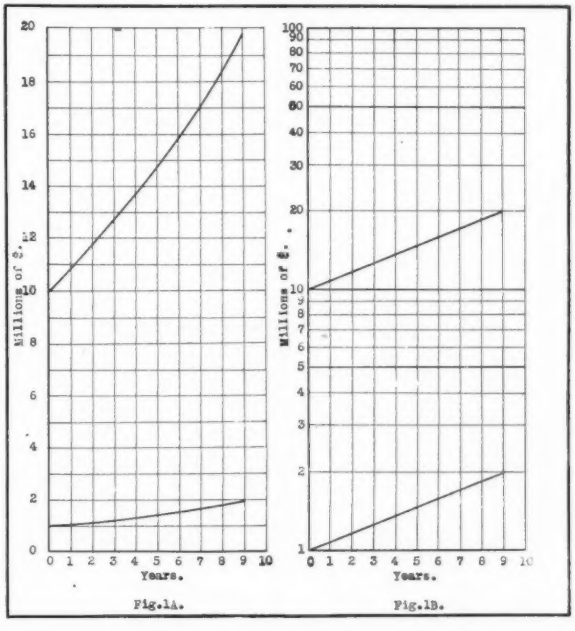

FIG. 1—*Growth of a Business*

be seen far more plainly. The ordinary style of charting, while perfectly correct, is misleading.

Such ratio curves allow easy interpolation; they can be extended as far as the sheet will permit; and they can be used for forecasting, all without appreciable extra work. The curves in 1A can be drawn only after the data have been completely calculated and such curves cannot be extended or future values accurately forecasted without a further somewhat laborious computation. On the other hand, if the direction of the lines in 1B has been once established they can be extended straight on and will forecast the value at any given time or the time at which any desired value will be reached. The same applies (with caution) to straight line ratio plots of experimental data, but here, unless the work is very familiar, there are plenty of chances to get misled. In general, the forecasting is best confined to business affairs.

Inventory Records

Now to elaborate a little on the hint already given regarding inventories. Charts can be made to show all sorts of things about them. One outstanding fact is that ratio inventory charts make small items look as important as they really are, and another is that low points stand out so prominently that they simply have to have attention.

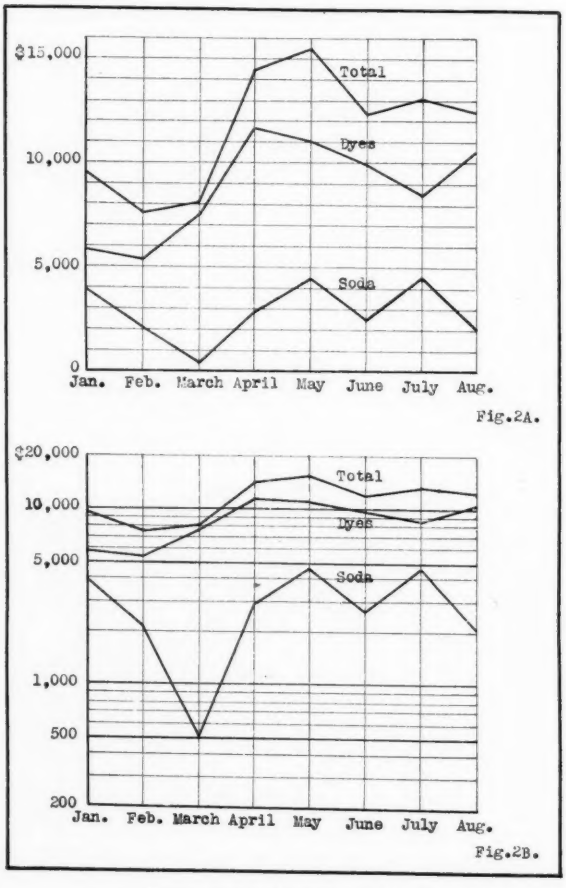

FIG. 2—*An Inventory Chart*

Fig. 2 is a part of an actual inventory covering soda and dyes for a few months, their total being also included for accounting purposes. The upper curves are smoother in the ratio chart because the changes in them are *relatively* less and do not show elements of danger. The soda curve is much the same in the two charts, less irregular than the others on ordinary paper and more so on the ratio ruling, because the variations are *relatively large*. Although representing a smaller item, the soda line stands out most prominently of the three ratio curves and the drop for March indicates the impending danger of shortage more sharply than the corresponding point in the other curve.

In a case like this, the method depends on the use that is to be made of the figures. If they alone (Table 2) are sufficient it is foolish to bother with a chart.

TABLE 2

Month	Soda	Dyes	Total
January	$3,850	$5,700	$9,550
February	2,220	5,400	7,620
March	533	7,500	8,033
April	2,800	11,750	14,550
May	4,500	11,000	15,550
June	2,550	9,800	12,350
July	4,550	8,500	13,050
August	2,050	10,500	12,550

For some purposes the older style may be perfectly satisfactory or even better, while for others the new may deserve the preference. For unfamiliar applications of this method of charting it is better to run the two along together until their characteristics become clearly evident, and then choose the one that tells in the plainest language what you wish to know. In this case the ratio chart gives a better historical record while the other might be found to be better to guide purchasing.

TABLE 3

Quality	First Auction	Second Auction	Per Cent Decline
70's	50	45	10
64's	42	34	19
58's	31	27	13
50's	23	18	21
46's	18	14½	19
40's	15	13½	10

To Compare Fluctuating Prices

Ratio paper is especially useful for comparing fluctuating prices and its peculiar characteristics show the more clearly, the greater the range of values. Take.

for instance, the prices in pence of wools at auctions held a month apart in London (and the idea is the same whether applied to wool, dyestuffs, chemicals, cotton, or any other commodity).

Fig. 3A is an ordinary chart showing these price declines. Since the chart starts at zero the relative values of the different kinds of wool are shown clearly by the relative heights of the several lines on the paper. These vertical distances are directly proportional to prices, but beyond this they tell little For convenience each line is marked with the per cent decline which it represents, but there is no similarity or connection between the lines for 70's and 40's, each of which took a 10 per cent drop in price, or between 64's and 46's, which both fell 19 per cent. This chart simply shows that at the first auction 58's sold for almost exactly twice as much as 40's, and so on, and that the higher grades *seemed* to fall off more rapidly in price than the lower qualities. The percentages have to be calculated if the relations are to appear in their true light.

Fig. 3B shows the same data plotted to approximately the same scale on ratio paper. It is noticed that the upper "curves" are closer together than on the ordinary paper and that their heights above the base line (which is 10) do not represent relative values so closely as in *Fig.* 3A. Again, each line has been marked with its per cent and here is the point of our argument. The 70's and 40's both fell off 10 per cent and the lines representing them are seen to have the same slant, even though one is at the top of the chart and the other at the bottom. The 64's and 46's both dropped 19 per cent. Here again the lines representing them are of exactly the same slant and the slope is considerably more than for 10 per cent. These relations are shown automatically, even though the lower grade wool in the first case sells for less than a third of the price of the higher and, in the second case, for less than half.

The other two show slopes corresponding with their percentage value, 13 per cent is a little steeper than 10, and 21 per cent has a little more slant than 19. By mere inspection, the slopes of the lines do not, of course, show the actual percentages, but they do indicate at a glance which prices have come down to an equal extent and which are relatively higher or lower.

Since the mind cannot readily carry the slopes of lines that represent definite percentages, it would be very easy to draw a few reference lines of known percentage value (slant) for comparison with those occurring in the chart, and in this way make the result still more definite.

Perhaps figures will make the matter a little clearer. A difference of 1 cent in a 10-cent price is 10 per cent, but in a 50-cent price it is only 2 per cent. Each 1 cent, however, has an equal spacing on ordinary paper. In the ratio chart each cent has a different spacing, but each *per cent* has the same value.

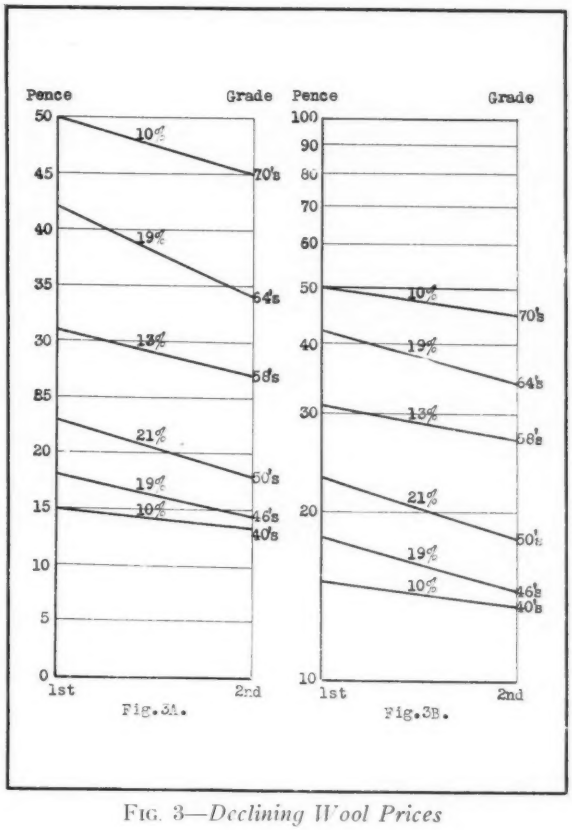

FIG. 3—*Declining Wool Prices*

HOW IT WORKS

This last example furnishes a good opportunity to explain the working of ratio paper, but the length and intricate appearance of this part of the exposition may seem to obscure its actual simplicity. It is really easy,

TABLE 4

Number	Log of Number	Difference
2	0.30103	
		0.30103
4	0.60206	
		0.30103
8	0.90309	

and to one who enjoys working out anything new half the fun is in trying to find out why and how.

Ordinarily, the first obvious effect in plotting on this paper is that the upper part of the chart appears as if compressed. This is done, of course, according to a mathematical law, and the result is that any per cent variation at the top of the sheet is represented by no larger or smaller rise or drop in the curve than the same per cent would be at the bottom.

In other words, it can be easily demonstrated that the vertical distance for an increase of 20 per cent is

the same in any part of a ratio chart; that is, a value 20 per cent greater than any other is always the same distance vertically above it. Similarly, points 20 per cent lower in value are always the same distance below the reference points, but this distance is not the same as for 20 per cent above. The same relations hold true for any other percentage.

Table 4 tells the story in figures:

The numbers written on a sheet of ratio paper would be 2, 4, and 8, but the actual distances marked off on the sheet to locate them were 0.30103, 0.60206, and 0.90309. In going from 2 to 4 or from 4 to 8 the increase is 100 per cent, but the *distances* traversed are equal, 0.30103. In going downward from 8 to 4 and 4 to 2 the decreases are 50 per cent and the distances equal. It is also obvious enough that the actual measured space representing 50 per cent going up will not be the same as 50 per cent coming down.

For more detailed explanation of the various principles involved, consult the references in the complete list which will appear in the final installment of this series. The writers have found the following particularly good:

1. How to Make and Use Graphic Charts (1922). Allan C. Haskell. Codex Book Company, New York.
2. Graphic Charts in Business (1922). Allan C. Haskell. Codex Book Company, New York.
4. The Ratio Chart and Its Applications. P. A. Bivins. Industrial Management, July to October, 1921, inclusive.

THE DYES USED IN PHOTOGRAPHY

(*Continued from page* 48.)

the sensitive materials. The more light there is in the darkroom the better the handling of the sensitive materials may be carried out.

The following list contains practically all the dyes that are used in making the safelights:

Dyes for Safelights—[3]

Tartrazine	Naphthol Green B
Brilliant Yellow	Filter Yellow K
Naphthol Yellow	Ponceaux
Fast Red	Auramine
Rose Bengal	Wool Yellow X Conc.
Victoria Blue B	Methyl Violet

Desensitizing

Luppo-Cramer, in some experiments on the desensitizing action of dyes on the photographic emulsion, discovered that when a photographic plate was bathed in a solution of Phenosafranine that the sensitiveness was lowered a great many times, this decrease in sensitiveness permitting development of the plate to be carried out in white light. Later, Lumiere and Seyewetz investigated a great number of dyes and found others that showed the same desensitizing effect. Recently Dr. Konig, of the Hoechst Dye Works, brought out two more dyes, called Pinakryptol and Pinakryptol Green. These have been successfully used as desensitizers.

Desensitizing Dyes—[4]

Safranine	**Toluyene**
Picric Acid	Phenosafranine
Aurantia	Pinakryptol

Pinakryptol Green

The Coloring of Electric Lamp Bulbs

There are several methods of coloring bulbs, all of which depend on the use of dyes:

1. By dipping the bulb in a gelatine solution, and after drying dipping the coated bulb into an acid dye solution, and then into 10 per cent formalin to harden the gelatine; or by adding the dye to the gelatine solution previous to coating. The acid dyes given for tinting transparencies should be used, with the addition of the acetic acid.

2. By using a solution of film base dissolved in acetone and amyl acetate with the addition of a spirit-soluble dye dissolved in a small quantity of wood alcohol.

3. By using a solution containing gum sandarac and gum mastic dissolved in benzol and ether with the addition of a spirit soluble dye as given under method No. 2.

Dyes for Lamp Bulbs—[5]

Oil Red	Fuchsine
Oil Scarlet	Auramine
Oil Orange	Safranine
Oil Yellow	Chrysoidine
Oil Green	Eosine
Oil Blue	Malachite Green
Oil Violet	Methylene Green
Bismarck Brown	Methylene Blue

Methyl Violet

Transparencies

The tinting and toning of motion picture films, lantern slides and other transparent positive materials consumes more dyestuff than any other branch of photographic work. In motion picture film tinting some of this work is now done by the manufacturers of the film by coloring the film base in the raw stock, or by coating the color on the back; but a vast amount of tinting is still done in the motion picture laboratories.

In the coloring of transparencies two methods are commonly used which depend upon dyes. These methods are "dye toning" and "tinting."

The process of dye toning depends upon the fact that some inorganic compounds will mordant certain basic dyes so that when they are placed in the dye bath the dye

attaches itself to the mordant. In the following list are the mordants that have been used with basic dyes:

Copper Ferrocyanide	Uranium Ferrocyanide
Vanadium Ferrocyanide	Silver Ferrocyanide
Tin Ferrocyanide	Silver Iodide
Iron Ferrocyanide	Silver Sulphide

Complex Chromium Compounds

The basic dyes that are commonly used for mordanting are:

Safranine	Brilliant Green
Chrysoidine	Methyl Violet
Auramine	Crystal Violet
Thioflavine	Methylene Green
Malachite Green	Methylene Blue
Victoria Green	Rhodamine

Phosphine

All basic dyes are suitable for this work.

The process of tinting consists merely in depositing a uniform coating of dye over the entire positive. Acid dyes are usually preferred in tinting, and in order to qualify, a dye should have the following properties:

1. It should be free from bleeding; that is, the dye should not readily wash out from the gelatine, as this action will cause dye spots in the positive.

2. There should be no change of color when the dye is diluted.

3. The dye should not bleach out under the action of acid "hypo" solution. This condition is necessary, as a small amount of hypo may be left in the gelatine if the transparency is washed out a short time before tinting.

4. The dye should not be precipitated by alum. In many motion picture laboratories the wash water is filtered through sand and alum.

The Eastman Kodak Company recommends the following dyes which fulfill the above conditions quite satisfactorily. These dyes were selected from over 400 different dye samples as being the most satisfactory:

Dyes for Tinting—[6]

Amaranth W	Naphthol Green B Conc.
Azo Rubine	Acid Green L
Croceine Scarlet MOO	Azurol Sky Blue
Scarlet GR	Direct Blue 5B
Wool Orange 2G	Acid Blue GR
Quinolin Yellow	Direct Brilliant Blue
Wool Yellow Extra Conc.	Fast Wool Violet B

The dyes are usually used at the concentration of 0.2 to 0.5 per cent with or without the addition of 0.02 to 0.05 per cent of glacial acetic acid, the acid being added to accelerate the dyeing.

The Hand Coloring of Transparencies and Photographs

For the coloring of transparencies and photographs, acid dyes are most commonly used because of the large number of available colors and their greater stability to light. The essential requirements for dyes for this work are that they be of a brilliant color, give a clear solution in water, and be soluble to the extent of 2 or more.

The following dyes have been found satisfactory:

Dyes for Tinting Transparencies and Photographs—[7]

Brilliant Red	Azurol Sky Blue
Wool Orange GG	Direct Brilliant Blue
Croceine Scarlet MOO	Direct Blue 5B
Tartrazine	Acid Violet
Wool Yellow X Conc.	Patent Blue
Quinolin Yellow	Ponceau 5R
Naphthol Green	Erythrosine
Acid Green L	Fast Brown
Acid Green B	Alizarine Cyanine

Fast Acid Violet

Dyes for Microscopical Stains

Dyes for this class of work should be of the highest purity. They are used to stain the microscopical slides to render certain things visible which could not be studied in any other way.

The list given below contains a few of the more important dyes, but is by no means complete, as the National Aniline & Chemical Company has a list of some two hundred and forty microscopical stains.

Partial List of Stains—[8]

Acid Brown	Crystal Violet
Acid Fuchsine	Eosine
Acid Green	Erythrosine
Acid Violet	Ponceau
Metanil Yellow	Fuchsine
Methyl Violet	Methylene Green
Auramine A	Methylene Blue
Aurantia	Rose Bengal
Azo Blue	Safranine
Bismarck Brown	Orange G
Malachite Green	Aniline Blue
Chrysoidin	Carbol Thionine
Brilliant Green	Gentian Violet
Congo Red	Iodine Green

Picro-Carmine

Conclusion

It is hoped that this article will clear up in the minds of the dye manufacturer and salesman some of the essential points as to the fields and applications of the dyes that are used in photography. Dyestuffs are not used in very large quantities in photography, but this field is consid-

(*Concluded on page* 88.)

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

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Published biweekly by
HOWES PUBLISHING CO., INC.
4109 Woolworth Building, New York City

A. P. HOWES, *President* E. S. PREDMORE, *Secretary*

Subscription price $5.00 per year: Canadian $5.50; foreign $6.00.

Vol. XII January 15, 1923 No. 2

"CA PASSE"?

THE arrival of M. Emile Coue in this country, approximating as it did so closely the meetings of the dye manufacturers, consumers, importers and importer-manufacturers with representatives of the U. S. Customs forces, turned one's thoughts by easy and natural processes in the direction of autosuggestion at a moment when, for the first time in tariff legislation, those most concerned made a conscious effort to get together for the purpose of advising and aiding the officials charged with the interpretation of governmental regulations.

M. Coue and his apostles hold that the will itself plays no part in the amelioration or complete banishment of the various ailments and troubles which afflict us. One murmurs, "It passes, it passes," believes implicitly that the trouble is being dispersed like chaff before a wind, conducts oneself exactly as though it had departed—and lo, the thing is done! Best of all, their system teaches us to do away with fear, which is never anything but a liability no matter what the outlook may be.

When the present dyestuffs tariff law was passed, it was feared by some that consumers had not secured justice for themselves. By others it was feared that the protection to the manufacturer might be insufficient in certain cases, and by yet others was it feared that the protection might be too great. It was likewise feared that there might be insurmountable difficulties in the administration of the law.

Whatever the virtues of the Coue method, there is present in it at least the virtue of sanity and calm conviction that everything can be made to come right. And now, for the first time since the question of dyestuff legislation was agitated, and coincident with the arrival of the distinguished assister of those who would heal themselves—or rather, as he himself puts it, aid the medical fraternity to heal them—comes the growing conviction in the industry that the solution of the problem of securing a square deal for all parties to the controversy is at hand. There are many reasons for optimism, not because the difficulties have been eliminated, but because for the first time sanity and common sense prevail. The committee of physicians has been selected; they should know their business if anyone can, and they enjoy, it is believed, the confidence of the public. It is because the proper machinery for doing away with the difficulties has been created and set in motion that there is good cause to hope for a successful outcome.

If any criticism could be made, it would be that the balance of representation on the Appraiser's Advisory Committee—to give it a semi-official title—is anything but equal. It is not believed for one moment that the individual members of it are not strictly honest and conscientious, all eight of them. It is not believed that they will not do their utmost to be absolutely fair. The only possible source of dissatisfaction would result from differences of opinion as to the classification of colors, and when such differences arise, as they are bound to, it can be seen that the dye manufacturers, who the law specifically states are to be its particular beneficiaries, will be hopelessly outvoted on every occasion.

Here we have two dye manufacturers lined up against six other men consisting of two consumers, two "Simon-pure" importers, and two importer-manufacturers. Out of this number, the dye manufacturers may reasonably expect to find consumers siding with them on disputed colors part of the time, thereby securing a tie vote at best. The interests of the other four are bound to run contrary to the dye manufacturers' interests on almost every count and, while it goes without saying that these latter will vote so as to express their honest convictions, it would be asking too much to expect those convictions to be wholly uncolored by inescapable prejudices arising from their position in business.

We wish no mistake as to our exact meaning, which is that it would seem as though, merely as a matter of principle, the balance of representation between the dye manufacturers, for the protection of whom the law itself specifically states it exists, and the consumers, importers and importer-manufacturers, should be more nearly equal.

Fortunately, however, the committee has no power to do aught save recommend. The Government will cast the deciding vote and have the final say as to which classification a disputed color shall be given. And as the classification, after hearing the arguments of both sides, ought to be obvious to impartial judges whose sole instructions are to protect the American dye industry, and to interpret the law and make their decisions with that end in view, it is the hope of The REPORTER that with the daily efforts of these several

parties, the originally expected trouble passes . . . passes . . . and that "day by day, in every way," consumers, importers, and manufacturers will be better and better satisfied with the works and pronouncements of the Committee of Eight.

A DYE CONSUMER SPEAKS OF THE COMPETITIVE CLAUSE

ON page 65 of this issue, in the Proceedings of the American Association of Textile Chemists and Colorists, will be found the contribution of George A. Moran, of the Pacific Mills, to the Association's discussion of the competitive clause in the new tariff bill. And this is well worth the attention of all parties concerned in the dye controversy.

It is important primarily because it is the view of a large consumer of dyestuffs, and it takes on added significance because of Mr. Moran's presence on the Committee of Eight which will aid the Customs officials in their rulings as to the duties paid by consumers on imported colors. And finally, it would appear to be one of the soundest, most logical and liberal pronouncements yet made. If all consumers accept Mr. Moran's views, there will be little chance for ill-natured argument and pleas of unfairness in the Government rulings to come.

The disarming quality of Mr. Moran's statement is his unflinching tendency to look facts squarely in the face, and to point out that if all will only be reasonable, there is no need for any to suffer beyond their capacity for endurance. Quite frankly he says, in effect: The purpose of the tariff is to decrease the use of imported colors in this country; if consumers want imported colors, they should be willing to pay the higher price—especially since such colors are usually wanted for special purposes which will stand the higher price.

How much time might have been saved if only some of our more obstinate Congressmen and Senators could have been made to see this fact several years ago! It is safe to say that the determination of one or two "little groups of wilful men" to interpret the consumer's views for him was responsible for holding up the enactment of dye legislation many, many moons.

Mr. Moran points out that about 90 per cent of dyestuffs consumed here are of domestic manufacture anyhow, and that only about 10 per cent of requirements are for imported products. In securing these, he says, the consumer is no longer hampered by the machinery of the license system; he can get any color he wants, from anywhere, if he is willing to pay for it, and Mr. Moran believes this to be just. We cannot forbear quoting a little further:

"From the point of view of the consumer it is certain if he wants a given dyestuff he can get it; if the decision of the Government is that the color is competitive, whereas he believes that it is not, he can still get it by paying perhaps 25 or 30 per cent more than if it were placed in the lower classification. This increase in cost, if the consumer really wants the dyestuff, will probably not deter him from buying it at increased cost; for, as already noted, these imported colors are used on the better grades of fabrics, which will usually stand the extra cost for superior results. As the object of operating a manufacturing business is to make a profit, those connected with the purchasing of dyestuffs will naturally endeavor to get them at as low a cost as possible. As the object of purchasing imported products is to meet a specific requirement not met by domestic products, if the imported product is higher in price the consumer could not make such purchase unless he considered it essential; and naturally he is likely to disagree with the Government should it decide otherwise, and disputes are therefore likely to arise. However, as above noted, in case of an adverse decision the only difference will be one of cost. The new tariff increases the cost of all imported dyestuffs. The competitive clause increases the cost still more of those so classified; however, that is what the tariff is for—to raise the price of imported products and thereby decrease their sale in this country.

"If we really want imported dyestuffs we should be willing to pay the extra price for them."

We believe that most of our readers will feel constrained to join in the applause with which this sensible statement was greeted.

A BIT OF HISTORY

THE announcement, elsewhere in these pages, of the Althouse Chemical Company's appointment of a New England selling agent—the L. B. Fortner Company—calls to mind, by turning attention to this Pennsylvania dye manufacturing concern, a period which, though far from long past when judged by ordinary standards of time, now seems, because of the rapid growth of the American dye industry, almost like the Dark Ages of its history. For the Althouse Chemical Company, makers of a well-known line of direct colors, is perhaps unique as the survivor of a considerable number of textile manufacturers who originally engaged in dye making to supply their own needs during the scarcity in the early days of the World War.

The parent concern of the Althouse Chemical Company is the Neversink Dyeing Company, of Reading, also owners of the Pennsylvania Dye & Bleach Works, of Harrisburg. The Neversink Dyeing Company in turn is a development of the old firm of Knoll & Althouse, the pioneer commission dyeing house of the Reading district. Mr. Althouse, Sr., treasurer of the Neversink Dyeing Company and of the Althouse Chemical Company, is the original Althouse of Knoll & Althouse. He established the dyeing firm of Knoll

& Althouse to care for the needs of the growing hosiery industry of his district. About the time the firm of Knoll & Althouse was started, C. Scott Althouse, the present president of the Neversink Dyeing Company and the Althouse Chemical Company, entered the Philadelphia Textile School, graduating in 1900. Scott Althouse, having secured several years of practical experience in the laboratories and works of some of the leading textile factories, returned to take charge of the technical work in his father's dyehouse. His energy and scientific knowledge gave additional impetus to the growing business, which was ultimately incorporated as the Neversink Dyeing Company.

Shortly before the beginning of the World War, not satisfied with breadth of future for a job dyehouse even of the largest size, the Althouses began experiments looking toward the establishment of an artificial silk plant. To this end they had gathered a corps of chemical and physical research workers. The business depression in the initial stages of the war made the carrying on of a research laboratory a burden if not an extravagance, and when business did come back it was handicapped by the scarcity and high prices of dyestuffs. What, then, could be more logical than to continue the research laboratory, but to change its objective from artificial silk to dyestuffs? This was the beginning of the Althouse Chemical Company. Early in 1915 the first dyestuff was produced: Sulphur Black. It will be recalled that in 1915 the supply of coal tar bases was meagre, if not entirely absent. While it was vaguely rumored then that nitrochlorbenzol was the proper intermediate to use for Sulphur Black, one might as well have asked for a slice of the moon, so far as availability went. Even what benzol there was had all been contracted for by the Allied Governments. The only base in anywhere near amply supply was naphthalene, and the early Sulphur Black of the Althouse Chemical Company was made from nitrated naphthalene. A good Sulphur Black was made from this intermediate: a black which not only supplied the needs of the Neversink Dyeing Company and freed them from the exactions of the dyestuff speculator, but which was in demand far above the ability of the Althouse Chemical Company to supply as a commercial dyestuff. A bloomy, non-browning Sulphur Black from a naphthalene base was indeed no small achievement. With the increased production of American coal tar bases, the Althouse Company began to extend its field. As soon as an adequate supply of benzol could be secured, benzidene was produced. It is believed this was the first commercial production of benzidene in America. With a supply of this important intermediate, the manufacture of direct colors began and among the early colors produced were Congo Red, Direct Blue 2B, Direct Violet N, Direct Orange, Yellow and Brown.

THE DYES USED IN PHOTOGRAPHY

(*Concluded from page* 85.)

ered a very good one for American dye manufacturers, since foreign dye companies find in America a profitable market even after paying the duty and shipping fees. If this market is so eagerly sought by foreign concerns it ought to be worthy of even more notice by American dye manufacturers.

In the references given throughout the text of this article, to which the authors are indebted for much of their information, will be found more complete and exhaustive accounts of the use of dyes in photography than was possible to furnish within the allotted space.

References

[1] "Wratten Light Filters" (Eastman Kodak Co. publication). Mees: "An Atlas of Absorption Spectra" (Eastman Kodak Co. publication). "Photomicrography" (Eastman Kodak Co. publication). Cassell: "Cyclopedia of Photography."

[2] British Journal of Photography Almanac, 1922. Mees: "Photography of Colored Objects" (Eastman Kodak Co. publication). Mees: "Wratten Light Filters." Walters and Davis: "Studies in Color Sensitive Photographic Plates, and Methods of Sensitizing by Bathing" (U. S. Bureau of Standards Paper No. 422). Wall: "Practical Color Photography." Cassell: "Cyclopedia of Photography."

[3] British Journal of Photography Almanac, 1920, 1921, 1922. Cassell: "Cyclopedia of Photography."

[4] British Journal of Photography Almanac, 1920, 1921, 1922.

[5] Since the list of dyes soluble in spirit is too long to be given here, the reader is referred to the dye list of Schultz and Julius.

[6] L. A. Jones and C. W. Gibbs: "The Absorption of Light by Tinted and Toned Motion Picture Film" (Transactions of the Society of Motion Picture Engineers, May, 1921). "Lantern Slides: How to Make and Color Them" (Eastman Kodak Co. publication).

[7] "Lantern Slides: How to Make and Color Them" (Eastman Kodak Co. publication). "The Tinting and Toning of Eastman Positive Motion Picture Film" (Eastman Kodak Co. publication). Cassell: "Cyclopedia of Photography."

[8] "Photomicrography" (Eastman Kodak Co. publication). Hind and Randle: "Photomicrography." Barnard and Pringle: "Practical Photomicrography."

The Fall Silk Dyeing Company, Paterson, N. J., has under consideration a new dyehouse, 60x90 ft., of brick and concrete construction, to take care of their increasing business. They have also just completed the installation of a new boiler, giving them double their former capacity. The purchase of fifteen lots east and north of their present plant assures them ground for future expansion.

The Rochelle Park Velvet Company, Hackensack, N. J., was incorporated to dye, finish, emboss and print all kinds of textiles. Capital, $100,000. Incorporators: Gustave A. Klinge, Erna Klinge, Lucy Hesse and Hans A. Hesse.

In the Chinese aniline dye market, indigo is the strong feature, and has recovered somewhat in price, Trade Commissioner L. W. Hoyt reports to the Department of Commerce. German indigo is selling at Shanghai, 53 taels per picul (133 1/3 pounds), while the best quality American indigo sells at 50 taels.

French interests are not in the market at present, and it is reliably reported that France is to sell aniline products through Germany with a later division of territory.

DYE MAKERS, USERS, IMPORTERS, ETC., WILL AID CUSTOMS MEN IN CLASSIFYING DISPUTED COLORS

Committee of Eight to Submit Three Lists to Determine Competitive and Non-competitive Products

A DEPARTURE from precedent was observed, and a definite move toward the establishment of a basis for the administration of the new dyestuff tariff law was inaugurated, when representatives of textile manufacturing concerns and large consumers of dyestuffs conferred on January 3 with officials of the Appraiser of Merchandise at the Appraisers Stores, New York City.

The result of this and other subsequent meetings was the selection of an unofficial advisory committee to aid the Department of Customs in the determination of competitive and non-competitive colors, as well as disputed colors. These lists will be submitted to the officials at another meeting January 15, when they will be checked up with the Department's own list of competitive colors, said to be 90 to 95 per cent correct, and a final working list, which will likely be made public, determined upon. The Department's list, because of its confidential nature, cannot be published.

The unofficial committee consists of eight men, two representing consumers, two dye manufacturers, two dye importers, and two importers-manufacturers. The members are W. D. Livermore, of the American Woolen Company, and G. A. Moran, of the Pacific Mills, representing consumers; Dr. E. H. Killheffer, of the Newport Chemical Works, and H. F. Wilmot, of the Synthetic Organic Chemical Manufacturers' Association, representing dye manufacturers; Paul Pickhardt, of Kuttroff, Pickhardt & Co., and E. O. Patz, of the Franklin Import & Export Company, representing importers; H. A. Metz, of the firm which bears his name, and Alfred F. Lichtenstein, of the Cincinnati Chemical Works and the Ciba Company, representing importers-manufacturers.

At the meeting of January 5 Mr. Moran, unable to be present, was represented by J. E. Bradley, also of the Pacific organization. Others who participated included Deputy Appraiser John Donnelly, Ernest W. Camp, Chief of Customs of the U. S. Treasury Department, who came from Washington to assist; W. F. Van Riper, of E. I. du Pont de Nemours & Co.; Franklin W. Hobbs, Arlington Mills; H. B. Peterkin, United Piece Dye Works; Andrew C. Imbrie, United States Finishing Company; George B. Flood, Arnold Print Works, and Thomas Brockhurst, Merrimac Manufacturing Company. The most noteworthy feature of the preliminary gatherings, which made no attempt to decide upon definite lists, was the fact that for the first time in the history of tariff administration, the manufacturers of the industry most affected were given a share in the promulgation of administrative advice.

The committee, while entirely unofficial and without power to enforce its views, is expected, nevertheless, to exercise considerable influence on the final decisions of the Customs appraisers as to the competitive or non-competitive character of disputed colors. The Government men expressed themselves as being glad of the availability of such assistance as the committee can undoubtedly furnish.

The meeting of January 4 opened with a short explanation of the difficulties confronting the Customs men in the administration of the new law. Mr. Donnelly, who acted as chairman of the conference, stated that it was felt by the Customs authorities that the textile men had a vital interest in the new tariff regulations and that their assistance was being requested by the Government in an endeavor to discover the best means of enforcing the provisions of the law, which was primarily intended as a protection to the American dyestuffs industry.

He requested that those present consult among themselves and appoint a committee to represent them, and that they hold themselves in readiness to answer any questions that the customs authorities might ask in relation to prices of dyestuffs. The information furnished by the manufacturers would be treated in strict confidence, he stated, and only specific replies to their queries need be given.

The point was also brought up by the textile men that it was the practice of some large companies to contract for their dyes for long periods at a given and staple price. It was asked if such a price would constitute a market price under the new tariff. Although no official opinion was given it appeared that the appraisers would be inclined to accept such a valuation of dyestuffs.

ALTHOUSE COMPANY NAMES FORTNER AS N. E. SELLING AGENT

Announcement has been made by the Althouse Chemical Company, Reading, Pa., that this firm has appointed the L. B. Fortner Company as its sole selling agent for New England.

WANTED—TEXTILE CHEMIST

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Disputes in Relation to Textile Fabrics

Shortsighted Selfishness—Bad Advice—Faults in Fabrics—Textile Perfection Impossible—Faults Crop Up Late—Carding—Weaving Faults—Dyeing and Finishing Faults—Disputes—Legal Decisions—Conference—Procedure—Matters Which May Be Referred to Arbitrators—Submission and Its Importance—Time Limit—The Award and Cost of Proceedings

By A. MITCHELL BELL

A paper read to the Halifax branch of the Foremen Dyers' Guild on March 7, 1922. Copyright of the Guild.

Printed in the Dyer and Calico Printer

THIS subject is undoubtedly an important one, one that bristles with difficulties, and not a small amount of unpleasantness. Still, if treated in a reasonable and candid manner, it may be possible for it to lead to an avenue which will be helpful to both the individuals engaged in the various branches of the textile industry, as well as to the industry as a whole.

The importance of the consideration of a subject of this kind cannot be denied by those who are fully acquainted with even a small portion of the troubles that have arisen and do arise between the parties connected with the different branches of the trade, and is readily admitted and welcomed by those who are cognizant with these troubles and difficulties that are more or less constantly occurring in one branch or another of the trade. It is the hope of your lecturer that his contribution in this direction may be of some assistance to his hearers in their future dealings with their troubles, and their obtaining the best means to acquire a reasonable, satisfactory and as speedy a settlement of them as possible.

Shortsighted Selfishness

It is to be regretted that there are still those in the trade who allow their selfish propensities to carry them beyond their inward sense of justice and powers of reason, and by so doing allowing themselves to be the ultimate losers in the end, advesely affecting their own trade, although they apparently gain their end in the case they have temporarily under dispute.

The injustices and anomalies that have arisen in the past in the aggregate are most appalling, and to all business men who wish to deal honestly and squarely with their business friends, creates within them mixed feelings of uneasiness, suspicion and mistrust, and in consequence do not assist in getting the trade as a whole back to that reasonable and conciliatory attitude which is so essential to bring about that happy and satisfactory feeling which is obtained when one feels assured of having done a square and straight deal one with another.

These injustices and anomalies do not occur only between masters, or representatives of firms, but are much in evidence among the operatives in the different spheres of textile activities. The method of passing the blame of any faulty result on to someone else, rather than a ready acknowledgment of it (if responsible for it), or a willingness to assist to the fullest possible extent any efforts to solve the difficulty and to place the blame in its rightful place, has much to answer for in regard to the friction and unpleasant transactions between individuals, and is not only an entirely wrong policy to adopt, but is one that has a reactionary influence, and eventually sooner or later has the unhappy result of recoiling upon the individual concerned.

To put this thought in a few words, and perhaps a little bluntly, the policy exhibited in relation to disputes of "everyone for himself and the devil take the hindmost," is not the right one to put into practice when trying to build up and weld together a community of business interests and friendships, which are certainly obtained and retained by proper and constant service, judicious consideration for the other man's point of view, and upright and honest dealing one with another.

Although some measure of excuse may be granted for the application of certain retaliatory methods against anyone who is known to be guilty of "trying it on" with those with whom he is having business transactions or in actual process work, as a general policy to apply to all whom we come in contact with in our many transactions, is a great fallacy, and should be deprecated and suppressed as much as possible.

I do not wish to suggest here that when any difficulties or troubles arise in the shape of faults, complaints and debits that they should be accepted without probing fully into the causes or rightfulness of them, but rather to insist upon a strict investigation, and as impartial a one as is possible under the existing circumstances, and never give up any ground until either one or other's case has been fully established, and both conflicting parties are satisfied as to who is the one responsible for its cause, and who should bear the blame and costs.

(To be concluded.)

1923 KNITTING ARTS EXHIBITION

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